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The Novelty Works, New York City.

THE accompanying engraving presents an interior view of a portion of the celebrated Novelty Iron Works of Stillman, Allen & Co., at the foot of Twelfth street, East river.

The position selected by our artist shows one end of the erecting shop, in which the various parts of engines and other machinery in process of construction, are assembled after having been cast, turned, and finished in the different shops composing this immense establishment. Here the final adjustment, and fitting of the several parts to each other are effected, and each member of the future machine adapted to perform perfectly and harmoniously its appointed function.

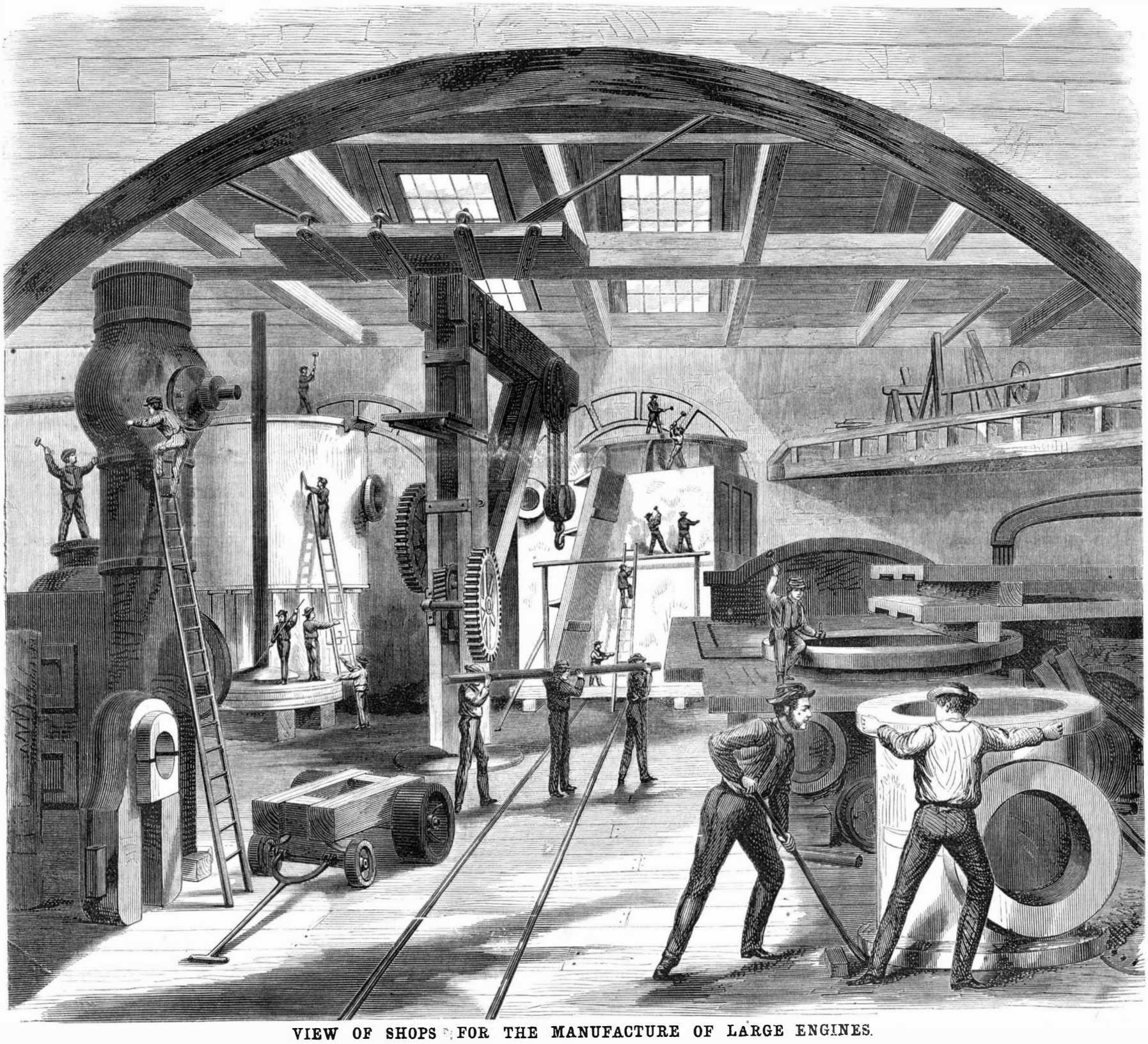
This shaft is to carry the working parts of Mr. Allen's adjustable cut-off now applied by this firm to all their marine engines with the most gratifying success. It is indeed a marvel of ingenuity and must challenge the admiration of all lovers of mechanical beauty and perfection. In front of the side pipe stands the main crank pin strap for the connecting rod. It is 4 ft. 6 inches long and grasps a crank-pin having 14 inches diameter.

Immediately to the right of, and behind the side pipe, are seen the piston and piston-rod, for the same engine. The former is 105 inches in diameter, while the piston-rod is 11 inches diameter and 19 ft. 4 in. long. The rod is firmly seated

mer and chisel. This foundation plate of the whole superstructure weighs 20 tons. To the right, and resting on the bed plate are shown the bed plates for a large 40 ft. lathe. Over these again, in the background, appears a portion of the tool gallery where the hand tools are kept ready for the workman's hand, but out of the way, and in place, when not in use.

The large casting in the foreground, right hand corner, is a jet condenser for a smaller 62 inch engine, and weighs 4 tons.

The shifting and placing in position of these heavy masses are effected by the use of the ponderous crane shown in the



VIEW OF SHOPS FOR THE MANUFACTURE OF LARGE ENGINES.

That the reader may have an intelligent idea of the nature and uses of the objects shown in the engraving, we propose to give some explanatory notes, obtained in a recent visit to the works, through the courtesy of Lyman Hall, Esq., the superintendent.

Most of the parts here shown belong to a large marine engine now building for the Pacific Mail Steamer *America*. She will be the twelfth vessel of this line fitted with machinery from these works, and has the following dimensions: Length 360 ft., beam 50 ft., and depth of hold 32 ft. 6 in., giving a burden of over 4000 tons. She is to be fitted with a single beam engine of 105 inches cylinder, and 12 ft. stroke, with Allen's adjustable cut-off.

In the left foreground of the engraving, will be seen the front lower steam-chest, and one of the side pipes with the cut off shaft passing through its upper portion.

in the piston by a conical expansion and large nut on the end of the former.

Just behind these may be seen the air pump and reservoir, with a ladder standing against it. This pump has a diameter of 62 inches and 6 feet stroke, the whole casting weighing 9 tons. In the central background and over the tramway stands the condenser, an immense and complicated casting weighing 21 tons. It is of the tubular kind and is to be fitted with Mr. Allen's wooden packing. On its top flange, where the workman is seen with a sledge hammer, the cylinder bottom will rest with a weight of 8 tons. Upon this again comes the main cylinder weighing 19 tons with its cover, weighing 7 tons. These are all supported by the condenser, which in its turn is to be securely fastened on the bed plate which is seen just to the right of the three central figures with a workman seated upon it, engaged with ham-

central part of the engraving, and by immense chains and pulleys to which steam power is applied.

The cylinder which is to form a part of the *America's* engine, is now being excavated from the sand pit in which it was cast, and has yet to go through the boring mill and finishing shop. Of the other parts not appearing in the engraving, the working-beam deserves mention. It weighs 24 tons without its centre pin, which alone weighs 4 tons.

The main shafts are 2 feet in diameter, and are probably the largest ever made entirely of charcoal iron, they having a weight of 24 tons.

Beside the large marine engine, we noticed a stationary engine of beautiful design and improved valve gear, in process of construction. This firm is also manufacturing Stephenson's & Luther's turbines, and Messrs. Stillman, Allen & Co., have recently added to their extensive works an architectural

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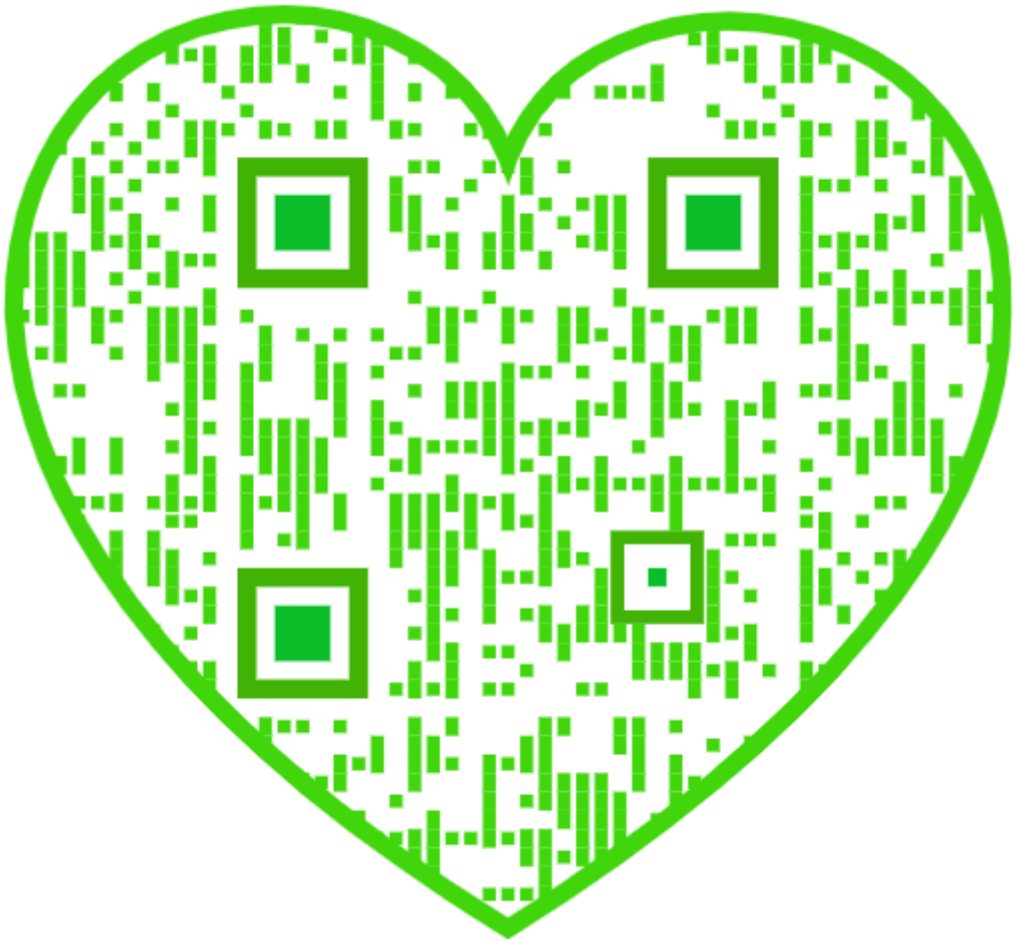

department, in which we noticed a building partly completed, of 65 feet front by 58 feet high, for parties at St. Pauls, Minnesota.

To the mechanic not already familiar with the building of heavy machinery, no more interesting place can be found for a visit than the Novelty Works. The ease and precision with which the largest work is planed, turned, and bored cannot fail to excite his admiration.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING JUNE 9, 1868.

Reported Officially for the Scientific American.

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ *Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to Inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.*

78,637.—Lamp Burner.—Lewis J. Atwood (assignor to himself and Holmes, Booth & Haydens), Waterbury, Conn.

I claim 1st, A cone or deflector with a circular range of springs to form the chimney holder, in combination with a perforated burner shell, to which said deflector and chimney holder are hinged, substantially as set forth.

2d, A ring, n, formed around the edge of the burner shell by the sheetmetal turned over, in the manner and for the purpose set forth.

78,638.—Plow and Planter.—G. C. Avery, Waldron, Ind.

I claim 1st, The combination of the rock shafts C C', standards d d, and seed boxes H H, arranged and operating substantially as described.

2d, The combination of the rake g, and seed box H, with the standard d, as set forth.

78,639.—Evaporator.—Pierre J. Badoux, New York city.

I claim the construction of the within described rotary evaporator, for evaporating all fluids at a low or high temperature, by means of the hollow spirals or serpentines, with any number thereof, substantially as described and set forth.

78,640.—Process of Treating Milk to obtain Useful Products.—Anna E. Baldwin, Newark, N. J.

I claim the impoved methods of obtaining products from milk, substantially as and for the purposes herein described.

78,641.—Potato Digger.—Edmund Bennett, Nankin, Mich.

I claim 1st, The method of separating the vines from the potatoes, by the curved teeth in the endless chain K, and endless belt L, and shield N, arranged substantially as described and for the purpose specified.

2d, The combination of the above with the frame or box A, the wheels B, the axles C, the cog wheels D and O, the pinions E H and P, the shafts G and I, the shaker M, the wheels X, the slatted scoop J, the lever R, the cord or chain S, and the fulcrum T, when constructed substantially as and for the purpose described.

78,642.—Folding or Ironing Table.—M. G. Briggs, Boston, Mass.

I claim the apparatus or device above described, consisting of the leaves A A', twin cross frames or legs c c' d d', and auxiliary leaf or shelf g, the legs being pivoted to each other and to the leaves, and provided with the stops f or f', and the whole operating together in manner and for the purpose as herein shown and described.

Also, apply one pair of cross frames or supports to the leaf by means of the bar h, and pin j, or its equivalent, essentially in manner and for the purpose as explained.

78,643.—Cheese Hoop.—L. Chapin, Antwerp, N. Y.

I claim the within described cheese hoop, composed of sheet iron and tin and formed in the manner specified.

78,644.—Making Horseshoe Nails.—S. E. Chase, Boston, Mass.

I claim in finishing nails the process of curving their bodies and beveling their points, and afterwards forcing them through an open die to shear off superfluous metal, substantially as and for the purpose specified.

78,645.—Hoisting Machine.—G. R. Clarke, New York city.

I claim primary wheels 32 and 33, pinion wheels 16 and 15, in combination with revolving case C.

Also, revolving case C, crank D, and collar O, when constructed, arranged and operated substantially as herein set forth.

78,646.—Elevator.—George R. Clarke, New York city.

I claim 1st, The combination and arrangement of the hollow and revolving table and worm parallel guides, rollers, and their supporting brackets, when the whole is operated by means of pulleys and endless belt, substantially as described.

2d, The endless belt t, when the same is used in combination with the table or platform p, anti-friction rollers b b, and screw thread arm t', when the whole is so constructed as to operate substantially as described and for the purpose specified.

3d, The combination of the lever r, the guide bar R, and the clutches, q and q', the stop lever H, and the stop pin w', when the same are used and operated in the manner substantially as described.

78,647.—Bedstead.—John C. Cline (assignor to himself and Henry C. King), Philadelphia, Pa.

I claim the bed bottom composed of the slats c, attached at head and foot to the bars e and f respectively, said bars being free to turn on end bearings or journals, in combination with springs k, and spring bar h, these several part being constructed, arranged and operating substantially as shown and described.

78,648.—Coffee Mill.—I. Fremont Colby (assignor to himself and Daniel C. Colby), Washington, D. C.

I claim providing the coffee mill with a supply reservoir B, in combination with the smaller chamber C, and chamber E, all arranged for the purpose specified and set forth.

78,649.—Fastening for Gloves.—Isaac Cole, Brooklyn, N. Y.

I claim the glove fastening consisting of buttons a and b, and chain d, the head of one button being hollow or partly hollow, and within which is placed eccentrically a vertical post e, and having on its periphery openings h k, and a contracted slot f, leading into the hollow head, whereby the chain enters through one opening, then around the eccentric post and out through the other opening, both in fastening and unfastening the glove, substantially as described.

78,650.—Thrasher for Grain, Clover, Flax, etc.—Lewis Cosler, Yellow Springs, Ohio.

I claim 1st, The adjustable arms M, as herein set forth.

2d, The extension sieve U, for the purpose set forth.

3d, The construction of the incline shaped throat L, when located at the top of the apron K, as herein described and for the purposes set forth.

4th, The arrangement of the two conveyers R and S, when located and operating with the sieve T, as described and set forth.

78,651.—Clothes Pin.—John O. Couch, Middlefield, Conn.

I claim the employment of a rubber or elastic compound, in combination with a metallic clothes pin made as herein described, and adapted to operate therewith, as and for the purposes herein set forth.

78,652.—Brace for Bit.—John W. Craig, Knoxville, Ill.

I claim the device for holding bits in braces, consisting of the pivoted spring lever C, formed with the toe b, which engages with the bit, the free end of said lever adapted to catch under the spring catch D secured upon the end of the brace and provided with a round hole for the passage of the bit, all constructed and arranged to operate as herein shown and described.

78,653.—Mode of Attaching Handles to Cross-Cut Saws.—Patrick Donoughe, Loretto Pa. Antedated May 19 1868.

I claim the arrangement of the handle a, ferrule b, washer c, rod d, and nut e, the whole being constructed, arranged and operating substantially as herein described and for the purpose set forth.

78,654.—Harvester Rake.—John C. Durborrow, Ellicott's City, Md.

I claim the inclined shaft C, jointed at G and provided with the fixed gear wheel B in combination with the revolving gear wheel E, and inclined rake and reel arms, all constructed and operated in the manner and for the purpose set forth.

78,655.—Penholder.—H. G. Eastman, Poughkeepsie, N. Y.

I claim 1st, The combination of the egg-shaped hand support or form A, with a penholder by means of the swivel joint or equivalent therefor, substantially as hereinbefore described.

2d, In combination with a penholder the ring F as hereinbefore set forth.

78,656.—Steam Engine Oscillating Valve.—John S. Everitt and Ossian Cook, Oshkosh, Wis.

I claim 1st, The valve boles S S, of the valve H, constructed with inclines n n, slots x x, arranged relatively to the arms m m, and valve stem C, as a means of adjustment in compensating for wear.

2d, The valve case A A, when constructed as described and arranged relatively to the oscillating balance valve H, as herein set forth.

78,657.—Mop Wringer.—John Filkins, Sandwich, Ill.

I claim the combination of the standards C C, D D rollers P R, springs Z Z, levers J J, having projections L, and treadle O, substantially as herein described.

78,658.—Petticoat Pipe for Locomotive.—W. G. Freeman, Richmond Va.

I claim the combination of the cone or converging sheet E, with a petticoat pipe D closed at its lower end, when arranged and operating as described for the purpose of equalizing the draft through the tubes by converging the escaping products of combustion towards the mouths or muzzles of the exhaust pipes.

78,659.—Beer Cooler.—Gerhard Fuchs and Jos. Luigart, Logansport. Ind.

We claim the pan H, and ice pan K, provided with a tortuous pipe J through which the beer is passed and cooled substantially in the manner specified and arranged under the pipes B B, as herein described all operat- for the purposes set forth.

78,660.—Fulling Mill.—Ernst Gessner, Aue, Saxony.

I claim 1st, The toothed segments c, gearing in pinions e, in combination with the beaters and tub or tubs of a fulling mill, substantially as and for the purpose set forth.

2d, The springs f or v, in combination with the tub or tubs of a fulling mill, substantially as and for the purpose described.

3d, The springs k, and adjusting screws k', in combination with the eccentrics L, the beaters B, of a fulling mill, substantially as and for the purpose set forth.

78,661.—Clothes Dryer.—Amos W. Griffith, Boston, Mass.

I claim 1st, The supports B B, constructed with a recess and openings in combination with the flexible frame D, and the fastenings d, as and for the purpose set forth.

2d, The flexible sliding frame, D D E, as and for the purpose specified.

3d, The flexible side pieces D D, in combination with the cord E, adjustable end piece D' D', as and for the purpose set forth.

78,662.—Fruit Gatherer.—R. S. Hall, Hamburg, Mich.

I claim the combination and arrangement of the semi-circular wires C, the outwardly projecting rim B, and the bag or conductor as herein represented.

78,663.—Tackle Block.—Jos. F. Harcourt, Cincinnati, O.

I claim a two or more sheave tackle block, whose partitions C extend from side to side in one piece and are formed with grooves G' in their sides for the reception of the inner forked strap D', all as herein described for the purpose specified.

78,664.—Corn Planter.—Wm. N. Harrison and John J. Harrison, Hornby, N. Y.

We claim the slide tubes J J, attached to cross bar j, the covering rollers K K, connected with hinged arms m m, and springs L L, and the double sets of seed holes f f', with shifting slide i, the whole arranged as described and operating in the manner and for the purpose specified.

78,665.—Corn Coverer.—J. D. Haynie, New Antioch, O.

I claim 1st, The arrangement substantially as described of the two series of rearwardly diverging tines F F', adjustable shares G G', g g', H, and roller I, as and for the purpose set forth.

2d, In combination with the described elements F F', G G', g g', H and I, of the preceding clause, the adjustable clevis L l m, for the object explained.

78,666.—Seed Planter.—Ashael Hays, Guy's Mills, Pa.

I claim 1st, The slide P, and droppers I I and H H, when operated as described for the purposes set forth.

2d, The whole seed planter, when constructed as described for the purposes set forth.

78,667.—Heel for Boots, etc.—Rudolph Herr, Brooklyn, N. Y.

I claim the combination of the above described yoke, sole, spurs, tap hole and heel, with its filling and cross bar, as within described and for the purposes set forth.

78,668.—Hat.—Fleury Huot and Constant Baudouin, New York city. Antedated May 23, 1868.

We claim a bonnet having metallic foil or leaf pressed upon its surface for the purposes and as specified,

78,669.—Plate for Artificial Teeth.—David S. Hutchinson, San Francisco, Cal.

I claim a flexible cavity plate, having in part or in whole the palatine portion of the plate made of flexible material D, in connection with a compound cavity or series of cavities, united or otherwise with a cavity on the center or palatine portion of the plate and upon the internal or external, or both, borders of the alveolar ridge, substantially as and for the purpose specified.

78,670.—Farm Gate.—T. W. Johnson, Grainger, Ohio.

I claim the links B B', gate A, links F, seat H, and lever G, as arranged in the manner as and for the purpose set forth.

78,671.—Sheep Shearing Table.—Wm. C. Jones, Orangeville, Ohio.

I claim 1st, The tilting table B, with the folding leg M.

2d, The spring-supporting rests E E, in connection with the notches J, in the legs C C.

3d, The bed B, provided with leaves A A, secured in position by the hook G, and staple H.

4th, The block D, in combination with the straps I and F F, all operating in the manner described and for the purposes set forth.

78,672.—Composition for Tanning.—Eli Keith, Wabash, Ind., and Alfred A. Eylar, Pontiac, Ill.

We claim the tanning composition and process, substantially as herein specified.

78,673.—Bomb Lance for Killing Whales.—Zeno Kelley, New Bedford, Mass.

I claim the hammer V, spring h, rod j, pin i, and bar g, in combination with the head E, all arranged as and for the purpose set forth.

78,674.—Electric Fan for Lamps.—Charles T. Mason, Sumter, S. C.

I claim 1st, The application of electricity to cause the revolution of a fan for the production of a draft of air, substantially as and for the purpose described.

2d, The combination of the electric coil A and fan F, and their respective equivalents, in manner substantially as and for the purposes described.

78,675.—Hoisting Apparatus.—J. Vaughan Merrick and Wm. H. Merrick, Philadelphia, Pa.

We claim the combination with a hoisting cage of a weight arranged to move in a contrary direction to the said cage, when the said weight is attached to arresting cams, levers, or their equivalents, all substantially as and for the purpose herein set forth.

78,676.—Apparatus for Making Bottles of Clay.—E. H. Merrill and H. E. Merrill, Akron, Ohio.

We claim 1st, The combination of the bar g, adjusting stays a, roller F, and bottle mold, in the manner substantially as described.

2d, The disk C' provided with curved or radial arms or grooves D', terminating within a short distance of the margin of the disk leaving a rim around the entire edge for the purpose set forth.

78,677.—Machine for Grooving and Swaging Sheet Metal.—Martin Metcalf, Grand Rapids, Mich.

I claim 1st, The peculiar arrangement and construction of the small frame C C C C with the rollers 1 2, and the oscillating shaft d, fig. 2, substantially as and for the purpose specified.

2d, The construction and arrangement of the small frame C C C C with the rollers 1 2, and the shaft d, in connection with the small lever b, slot f, and stop pin n, substantially as and for the purpose described.

3d, The combination of the parts constituting the small frame with its shaft d, rollers 1 and 2, cog wheels 1' 3', lever b, and thumb screw h, with the large frame A A, the stationary roller 4, and swedge rollers B B, and eccentric lever D, substantially as and for the purposes specified.

78,678.—Distilling Apparatus.—A. A. Meyendorff, New York city.

I claim 1st, Arranging in one distilling apparatus two stills and connecting them by means of pipes in such manner that the vapors of one can be forced through the mash in the other, substantially as herein shown and described, for the purpose of completely extracting the alcoholic contents of the mash, as set forth.

2d, Arranging in combination with the double still A B, a testing apparatus consisting of a tub f, and worm c, and so operating that the strength of the mash can be ascertained directly from the still, as set forth.

3d, The vapor collector G, arranged between the still and rectificator H, of a distilling apparatus, substantially as herein shown and described for the purpose of condensing the weakest and most impure contents of the vapor, as set forth.

4th, The rectificator H, when provided with false bottoms g and h, between which detaining devices l l are arranged, and when so arranged that all liquids condensed above the lower false bottom g, are by means of pipe j and K, or j alone, separated from the low-wines in the lower compartment of the rectificator, substantially as herein shown and described.

5th, The vessel L, containing decomposing or flavoring ingredients, when arranged in combination and connection with the rectificator of a distilling apparatus, substantially as herein shown and described.

6th, A distilling apparatus consisting of two boilers A B or a vapor collector G, rectificator H, column I, and final condenser J, and of a vessel L, containing decomposing or flavoring ingredients, all operating substantially as and for the purpose herein shown and described.

78,679.—Manufacture of Shovels.—H. M. Myers, Allegheny City, Pa. Antedated June 5th, 1868.

I claim a blank for the manufacture of shovel blades, made of steel or iron, of the form and with the tang portion split, substantially as herein described and for the purpose set forth.

78,680.—Switch for City Railroads.—Thos. Newman, New Orleans, La.

I claim the supplemental short bars B, in combination with an ordinary switch C, at the point at which a single-track city railroad runs into two tracks when constructed as shown and described for the purpose set forth.

78,681.—Machine for Cutting Files.—W. T. Nicholson (assignor to the Nicholson File Co.), Providence, R. I. Antedated June 5, 1868.

I claim in a file-cutting machine a rolling bed whose longitudinal axis is set angularly with the line of motion of the carriage, or of the cutting chisel if the former be stationary and the latter movable, in combination with such cutting chisel, substantially as described for the purposes specified.

78,682.—Grain Drill.—M. L. Nickels, Dunlapeville, Ind.

I claim the arrangement of the slotted arms C C, pitman D, slides F F, and plates H H, with the frame A, and its hoppers I, when the several parts are constructed and operating substantially as and for the purposes set forth.

78,683.—Shoe Brush.—J. E. Nolan, Chicago, Ill.

I claim the combination of the brush B, with the piece b, projection d, the connecting piece a, screw c, and brush A, as specified.

78,684.—Machine for Threading Thimble Skeins.—W. T. Norton, Dundee, Ill.

I claim 1st, The improved machine for threading thimble skeins consisting of the parts herein specified and shown, all constructed and arranged as described.

2d, The device G, with the lug H thereon, the slide A' having a head B, the rod C, slide D, lever E, and hook F, all constructed and arranged substantially in the manner set forth.

78,685.—Grate and Ash Sifter in Cooking Stoves.—D. E. Paris, Troy, N. Y.

I claim, 1st, A fire grate, made in two parts, having journals eccentrically attached, and arranged to dump or discharge its contents from the center of the dre box, whenever the two parts are moved off their supports and allowed to fall down perpendicularly, substantially as described.

2d, The elongated points o o on the shaker E, or stops on the side plate of the stove for the shaker to strike against or an equivalent therefor, which shall prevent the shaker from driving either part of the grate in too far when in use, and so as to prevent it from dumping while in operation.

3d, The support bars c c, placed over and in combination with a vibrating fire grate, for the purpose herein described and set forth.

4th, A sifting pan situated below or in front of a fire grate, having attached to its bottom sides or ends, two or more open movable sifting grates or sieves, and arranged to vibrate inside of the stove by means of a pronged handle or double shaker operated from the outside of the stove, substantially as herein described and set forth.

5th, The lifting and sifting grate G H, or equivalent, in the hearth of a cooking stove, provided with journals, I I projecting through the hearth, and adapted to be shaken or vibrated from the outside substantially as shown and described.

6th, A bail, attached to a sifting pan, or to its movable bottom grate or grates, and so arranged as to move the grate or grates backward and forward by raising said bail up perpendicularly and letting it down horizontally substantially as herein shown and described.

78,686.—Water Reservoir Attachment to Cooking Stove.—D. E. Paris, Troy, N. Y.

I claim, 1st, A cooking stove constructed to be used with or without a water reservoir by means of an opening through the back of the stove, through which the flue passes when used with a reservoir, and which is closed by a movable piece, or by a pipe collar bag, when used as a plain top stove, substantially as herein shown and described.

2d, A pipe collar, or a flue-opening through the rear part of the top plate of a cooking stove or range arranged to receive a smoke pipe, also an opening through the back plate of the stove arranged to receive a reservoir seat or flue chamber, so that either opening may be used separately or alternately as an exit passage substantially as and for the purpose described.

3d, A reservoir or water tank having the whole or a part of the bottom surface elevated sufficiently far to sit over an ordinary pipe collar, and so that the outer edges of the reservoir will set down level on the stove top, substantially as herein shown and described,

4th, The extension piece or reservoir seat D, serving both as a sunken nit or flue chamber underneath the reservoir, and also as a top covering to a warming closet, when said piece or seat is fitted to and combined with an ordinary stove top and so arranged that the stove can be used with or without said piece, substantially as herein described and set forth.

78,687.—Oven of Cooking Stove.—D. E. Paris, Troy, N. Y.

I claim, 1st, The heating of the oven of a cooking stove by direct radiation from the fire box through the plates intervening between the two when said plates are constructed with bars and damper, substantially as and for the purpose described.

2d, The broiling pan and rack P and R, constructed and located as and for the purpose described.

3d, The self supporting oven slide I, constructed and arranged as herein shown and described.

4th, A slide or rack placed at or near the bottom plate of the oven either over or under it, and made self-supporting when partly or mostly drawn out substantially in the manner and for the purpose herein described.

5th, A movable self-supporting roasting spit or rack, arranged with hooks, or appliances for holding meat while roasting, placed at or near the top part of the oven of a cooking stove or range, in the manner substantially as and for the purpose described.

6th, A movable oven crane or rack, made to swing in or out of the oven of a cooking stove or range, placed at or near the bottom, or at the top of the same, or attached to the back oven plate, substantially as and for the purposes herein described.

7th, For stove ovens, a movable self-supporting rack or spit, for holding meat while rosting, in combination with a movable self-supporting oven slide or crane, made for holding a dripping pan, and placed underneath said spit or rack.

78,688.—Hot Water Tank on Cooking Stoves.—Daniel E. Paris and Chas. S. Davis, Troy, N. Y., assignors to D. E. Paris, same place, and Clement Olhaber, Cincinnati, Ohio.

We claim, 1st, The horizontal flue in or under the bottom of the reservoir, formed by elevating a part or the whole of the bottom above the outer lower edges of the reservoir sufficiently high to allow the products of combustion to pass rearward under the same into the exit pipe, substantially as described.

2d, The base slide or bottom piece g g, or its equivalent, made either permanent or movable and and forming the rear part of the bottom to said horizontal flue, and connecting both with the reservoir and the back flue piece G or its equivalent, substantially as herein described and set forth.

3d, The self-mounting cover or covers C C, together with the back piece D, formed with the concave prongs N N, the convex half rounds O O, the crooked hooks L, and the elongated slot M, or their equivalents, so arranged and hung that the drip of the cover shall fall back into the reservoir.

4th, The attaching, fastening or supporting a reservoir to or by a stove top by means of bolts, pins, bars, hooks or lugs i serted in or through the ordinary pipe collar or exit passage opening of the top plate of the stove.

78,689.—Tube Well.—A. B. Parsons, Dunton, Ill., assignor to himself and Edward Redhead, La Crosse, Wis.

I claim the combination of the tube C, provided with grooves and holes, the spirally arranged wire coil E, and the gauze screen F, arranged and operating in the manner and for the purposes set forth.

78,690.—Caster.—John W. Pugh, Grand Rapids, Mich.

I claim the disk A, with a square opening in its center, and provided with a space within which works a slotted metal plate C, when used in combination with the caster, having a shank B, with grooves on three sides, as herein set forth, all constructed and operating substantially as specified,

78,691.—Composition for Setting Posts, Timber, etc.—Amos D. Purinton, Dover, Mass.

I claim the above described argillaceous composition, as well as the employment or use of it, substantially in manner and under circumstances and for the purposes as described.

78,692.—Lumber Dryer.—Julio H. Rae, Syracuse, N. Y.

I claim a kiln A, for drying lumber, peat or other materials, containing the following combination, to wit, a corrugated metallic roof and metal lining r a, gutters d e, traps h, and wells F, substantially as and for the purpose described.

78,693.—Stem Winding and Setting Watch.—O. P. Rice and J. H. Gerry, Springfield, Mass.

We claim the reciprocating arbor K, having the incline d, and annular groove e, in combination with the segment x, spring lever q', when constructed and operating substantially as herein described and set forth.

78,694.—Tile Cutting Machine.—John Shellaberger, Shane's Crossings, Ohio.

I claim, 1st, The pivoted cutters C E D F, constructed and operating substantially as and for the purpose described.

2d, The hinged frame B, in combination with the cutters C D E F, for the purpose of adapting them to cut in a vertical plane, substantially in the manner and for the purpose specified.

78,695.—Sugar Evaporator.—William C. Smith, Warrensburg, Mo.

I claim the pan A A, as arranged on the body R, of the device, and in connection with the flues formed by the partition D, and the dampers m m, and the pan B B, divided by the partition r, having a gate h, when used in connection with the movable frame F, carrying the skimmer i, and a driver J moving upon the cogs L, by means of the cog wheels c, operated by the cranks n n, and used substantially as described and for the purposes set forth.

Also the dampers g g g g, with the connecting bar G, and the ashpit S, when applied to a sugar evaporator substantially as and for the purpose specified.

78,696.—Machine for Cutting Leather.—Caleb S. Stearns (assignor to himself, Chas. F. Davis and Thomas Corey), Marlboro, Mass.

I claim attaching the cutter or die to a movable frame, so that it can be brought over any portion of the table B, in combination with a mechanism attached directly to the frame and moving therewith for depressing the cutter, substantially as described.

Also the frame U, in combination with the movable frame C and the clutch, for throwing the mechanism into action which operates the cutter, substantially as set forth.

73,697.—Machine for Splitting and Rolling Leather.—Caleb S. Stearns (assignor to himself and Thomas Corey), Marlboro, Mass.

I claim, 1st, The roller S for rolling leather, in combination with the carrying cylinder C, when the roller S is acted on by levers T or their equivalent, all constructed and arranged substantially as and for the purpose described.

2d, The blocks M, with the springs N acting independently of each other, and constructed substantially as described.

3d, The screws Q and plates R, in combination with the knife E, substantially as set forth.

4th, The roller D, for feeding the split leather out of the machine, when used in combination with the carrying cylinder C, and arranged substantially as and for the purpose set forth.

78,698.—Pen and Pencil Holder.—Ambrose Tower, New York city.

I claim a pencil point protector having barrel l' and slot s, in combination with the stamped plate fig. 1b, constructed and operating substantially as specified, and all equivalents of the same.

78,699.—Nail Extractor.—James Tyzick, St. John, N. B.

I claim the combination of the lever A, sliding fulcrum D, and hook or gripper E, the whole constructed and arranged to operate substantially as specified.

78,700.—Harvester Rake.—John Underwood, Muscatine, Iowa

I claim, 1st, The combination of a revolving rake and gatherer, a concave grain receiver B, a rear elevated platform C, a reciprocating follower P, and a binder's support K or D, operating substantially in the manner and for the purposes described.

2d, The revolving rake and gatherer with its teeth applied to a rocking bar, in combination with the devices described and shown for causing the teeth to assume in their circuit the different positions required, and with a concave grain receiver, substantially as and for the purpose described.

3d, The binder's support K, which is attached to the finger bar, in combination with the elevated platform C and reciprocating follower P, substantially as described.

78,701.—Knife for Splitting Leather.—Arzy E. Van Gieson, Newark, N. J., administrator of the estate of Amzi H. Van Gieson, deceased, assignor to Newark Patent Leather Company.

I claim the construction of a knife for splitting leather, in sections, forming together a continuous knife, substantially as hereinbefore set forth.

78,702.—Head and Shoulder Rest.—Abraham V. W. Van Vechten, New York city.

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I claim a head and shoulder rest composed of the main strap A, branches B, loops D, and head rest E, all as shown and described.

78,703.—SPUR.—Samuel Wehrly (assignor to himself and E. V. Sutter), San Francisco, Cal. Antedated May 4, 1868.

I claim a spur having the dog o, the rack m, and arm d, together with the spring c, and slotted plate b, the whole constructed and operating substantially as and for the purpose described.

78,704.—LUBRICATING JOURNAL OF CAR SHAFT.—Isaac P. Wendell, Philadelphia, Pa. Antedated May 23, 1 68.

I claim, 1st, The combination of the air chamoer D with the oil distributing plate B and supply tube C, arranged in the oil box A, or other oil reservoir, substantially in the manner above described and for the purpose set forth.

2d, The box A, having a division plate a, and oil chamber, b, beneath it, in combination with the distributing plate B, substantially as described and for the purposes specified.

3d, The const uction of the distributing plate B, with inclines and scrapers, substantially as described and for the purpose set forth.

78,705.—SPRING SEAT.—John L. Whipple, Detroit, Mich.

I claim the spring seat herein described, the same formed by the combination with the frame A, of the series of double-coil springs D, on the four sides thereof, and having their loops or bights pointing inwardly, and connected by the transverse and longitudinal interlaced webbing, as and for the purpose set forth.

78,706.—CHURN.—Melvin Wood, Babe's Corners, Mich.

I claim the combination of the box A, posts, B B, double crank C, the connecting rods D D, the oscillating dashers E E, the cover F, the false bottom G, the openings H I J, and the balance wheel K, and water spaces, L L, when arranged and operating for the purposes herein set forth.

78,707.—MACHINE FOR EDGING WALL PAPER.—William P. Yeoman, Waukegan, Ill.

I claim, 1st, The combination of rollers J K, spring P, knives S S, cloth m m, and rings N O, substantially as and for the purpose set forth.

2d, The combination of the table D with rollers J K, substantially as herein specified.

78,708.—HARVESTER.—G. W. N. Yost (assignor to Corry Machine Company), Corry, Pa.

I claim, 1st, The frame A of a mowing machine, when constructed of a single bar a, approximating in form to a horseshoe, and a transverse strengthening bar b, when the extremities of the bar a, are bent down for the attachment of the shoe E, and finger bar, substantially as herein shown and described.

2d, In combination with the above, the main wheel, C, when arranged between the driver's seat and the transverse bar, b, substantially as and for the purpose set forth.

3d, The wheel, J, on the hinged bar, I, in combination with the slotted shoe, E, and with the lever, f, all made and operating so that the finger bar can be easily raised by means of the lever, f, as set forth.

78,709.—HARVESTER.—G. W. N. Yost (assignor to Corry Machine Company), Corry, Pa.

I claim the movable adjustable shoe, G, when arranged substantially as described, so as to adjust the width of the swath to the capacity of the binder, as set forth.

78,710.—HARVESTER.—G. W. N. Yost (assignor to Corry Machine Company) Corry, Pa.

I claim the described combination with each other of the finger bar, G, finger bar holder, F, pivot a, posts, J and J', cord or chain, b, and lever, H, all made and operating substantially as and for the purpose herein shown and described.

78,711.—HARVESTER REEL.—G. W. N. Yost (assignor to Corry Machine Company), Corry, Pa.

I claim, 1st, Making the sweeps of harvester reels of flexible bands or straps, substantially as herein shown and described.

2d, Making the arms by which the sweeps of a harvester reel are connected with the shaft, A, of spring metal so that they can be folded against the shaft when the sweeps are taken off, as set forth.

3d, A harvester reel, when composed of the shaft, A, spring bars, B, and bands or straps, C, the latter being adjustable on the bars, B, and all made and operating substantially as herein shown and described.

78,712.—MOWING MACHINE.—G. W. N. Yost (assignor to Corry Machine Company), Corry, Pa.

I claim hanging or pivoting the vibratory lifting bar, Q, upon the crank shaft, substantially as and for the purpose set forth.

Also, in combination with the vibratory or lifting bar, Q, the stationary segment, traveling pinion and hand lever, or its equivalent, by means of which the said bar, Q, may be readily manipulated by the driver, which at the same time it is free to move, as required, when not controlled by him, substantially as described.

78,713.—ROAD SCRAPER.—Nicholas E. Yost, Corry, Pa.

I claim, 1st, The reversible timbers, A A', pivoted upon a center brace, when constructed and operating substantially as and for the purposes set forth.

2d, The timber, A, in combination with the two plow points, B B', constructed and operating substantially as and for the purposes set forth.

3d, The timber, A', in combination with the two castings, C C', constructed and operating substantially as and for the purposes set forth.

4th, The extension brace, E E', in combination with mortise, e, tongues, f bolt, g, and castings, D D', constructed and operating substantially as and for the purposes set forth.

5th, The tongue, I, and cross bar, J, when secured to the scraper by means of bolts, e and g, and in combination with the timbers, A A', constructed and operating substantially as and for the purposes set forth.

78,714.—CORN SHELLER.—J. C. Zimmerman, Eberly's Mill, Pa.

I claim the combination of the casing, B, its springs, x x, and sheller, F, with the sieves, S R, fans, h h, conveyor, P, operated the shafts, D H, and their cogs, the whole constructed as and for the purposes specified.

78,715.—PAPER BOX.—William Armour, Belfast, Ireland.

I claim, 1st, A paper box composed of the two covered boxes, A A, united by the hinge, a, in the manner described.

2d, The elastic fastening, C', to the hinged boxes, A A, as described.

78,716.—NET FOR FISHING.—Benjamin Arnold, East Greenwich, R. I.

I claim, 1st, The method herein described of intetlooping, twisting, and orming a net of a continuous length of cord, substantially as described.

2d, Netting constructed as herein described, as a new article of manufacture.

78,717.—FLUE BLOCK.—John Binns, Oskaloosa, Iowa.

I claim the combination of the hollow cylindrical block, A, having an outer shoulder, a, the outer cylindrical block, C, having internal shoulders, b, under its upper end to form a square chamber, the core, B, sections, e, and perforated cap, E, all constructed and arranged as shown and described for the purpose specified.

78,718.—PICK HANDLE.—William Blay, Helena, Montana Territory. Antedated June 4, 1868.

I claim the metallic strap, B, constructed and applied to the pick handle as shown and adapted to be pressed through the eye of the pick and secured therein by means of a key, m, as described and represented.

78,719.—TIRE SHRINKING AND PUNCHING MACHINE.—Walter Britton, Abingdon, Ill.

I claim, 1st, The plate, D, bearing slotted lugs, a a, the cam levers, E E, spring, b, in combination with the frame plate, G, slotted lugs, e e, all constructed, arranged and operating substantially as shown and described and for the purpose set forth

2d, The plate and punch M and n, and stirrup, L for joint use with the subject matter of the preceding claim, in the manner and for the purpose described.

78,720.—WATCH.—Edouard Chatelain (assignor to Ernest Francillon, St. Imier, Switzerland.

I claim, 1st The sliding stem carrying the loose wheel B and the sliding clutch C in combination with the oscillating levers, D and E, which operate so that the clutch will by them be moved in an opposite direction to the sliding motion given to the stem substantially as and for the purpose herein shown and described.

2d, The above in combination with the spring, F, made and operating as described.

3d, The loose bevel-gear wheel, B, which is only turned when connected with the sliding clutch, C, in combination with the bevel-gear wheel, H by means of which motion is imparted to the wheel which winds up the spring, as set forth.

78,721.—APPLE PARER, CORER AND SLICER.—Andrew Clark, La Fayette, Ind.

I claim 1st, The cam plate, R, and its dependent mechanism substantially as described for the purpose of paring apples and other similar fruit, all as set forth.

2d, A sash, D f f C, and a yielding fork O with its proper mechanism substantially as described in combination with the radial cutters, c, coring tube, d, and cylinder, V, all as set forth.

3d, The cam plate, R, wheel, T, plate, S, and arm, U, all constructed and operating substantially as and for the purpose set forth.

4th, The arrangement of the several parts of the machine, substantially as shown and described and for the purpose set forth.

78,722.—SPITTOON.—E. Detwiler, Milwaukee, Wis.

I claim a spittoon constructed with outside shell A with cover B with inside curb C with receptacle, D, lever F with treadle F, and connecting rod, H, secured together with springs, I I, substantially as and for the purpose specified.

78,723.—TRACTION RAILWAY BRAKE.—Rudolph D'Heureuse, San Francisco, Cal.

I claim the double-flanged or grooved wheels for brakes on railway cars, applied and operated substantially as herein described and represented.

78,724.—HOE.—Josiah Dodge, Grass Valley, Cal.

I claim in combination with a hoe the pick B, and the forked shank, D, substantially as and for the purposes herein shown and described.

78,725.—SHINGLE MACHINE.—L. H. Dodge, Oshkosh, Wis.

I claim the combination of the shaft P, sleeve m bevel wheels M N Q L, the arms a b, arm D, and plate E, of the carriage, substantially as described for the purpose specified.

78,726.—TAILORS' RULE.—Patrick W. Dolan, Jersey City, N.J.

I claim 1st, The rule consisting of the parts A C, grooved in each edge to receive the ends of the clasps D E the latter being provided with a set screw G, all constructed and arranged to operate in the manner and for the purpose substantially as herein set forth.

2d, In combination with the adjustable rule A C the head piece F, having a curved upper surface and the pivoted tape H, substantially as and for the purpose set forth.

3d, The adjustable rule A C, provided with the head piece F, shaped substantially as shown and the tape measure H, the whole arranged substantially as described for the purpose specified.

78,727.—BRUSH.—John F. W. Dorman, Baltimore, Md.

I claim the combination of the package A, when constructed as described with the handle B, having a male screw on its lower end and the tapering ferrule D, having at its upper end a female screw to receive and hold the handle, the several parts being constructed to operate in the manner and for the purposes set forth.

78,728.—PLANING MACHINE FOR WOOD.—Frank Douglas, Norwich, Conn.

I claim 1st, The braces e e, when constructed in the double-inclined form, and used in connection with the plug or wedge F, in the manner and for the purposes specified.

2d, The fixed guide G, when employed in connection with the cutter head C, and the table E, substantially as and for the purpose set forth.

3d, The combination of the tapering spindle B, having a cylindrical screw on its lower end with the tapering socket having its lower end cylindriform and cut into a female screw to receive the screw on the lower end of the spindle when said parts are constructed to operate in the manner described and employed for the purpose of attaching a cutter head to its shaft.

4th, The combination of the taper-bearing box n, with the oil cup m, when made so as to slide one on to the other to adjust shaft A, to its proper bearing and to compensate for the wear of said parts, in the manner specified.

78,729.—SEWING MACHINE.—G. A. Fairfield, Hartford, Conn.

I claim 1st, The combination with the oil hole above the needle bar of the crossing distributing passages in the top of the needle bar, whereby all the sides or faces of the bar may be oiled at the same time from a single orifice and from the outside of the casing.

2d, The combination with the oil grooves in the needle bar of the orifice for conducting oil to the axis or pivot of the thread conductor, substantially as shown and described.

3d, The combination with the devices last above claimed of an oil passage, for lubricating the link which actuates the needle bar.

4th, The tension device described the same consisting of a flanged roller and a rigid curved yoke spanning part of its periphery and adjustable as to its pressure by a spring.

5th, As a means for varying the feed, the employment of an adjustable rod having a pin or projection thereon movable within a slotted sleeve upon the rock shaft that imparts motion to the feed bar, substantially as shown and described.

6th, The combination with the lever q, and its plate of the rod, sleeve, and rock shaft, substantially as and for the purpose set forth.

7th, The spring R, for imparting adjustable pressure to the presser foot, when constructed arranged and operating as described.

8th, A shuttle race slightly inclined to the line of traverse of the shuttle, driver, as and for the purpose set forth.

9th, A shuttle race and shuttle driver race cast in one piece when the same are in lines which approach each other.

78,730.—MANUFACTURE OF FERTILIZERS.—Levi S. Fales, New York city.

I claim 1st, The within-described process of preparing the bones or equivalent highly-nitrogenized substances previous to their admixture with other materials, substantially as herein set forth.

2d, The manure composed of the several materials set forth, combined in the manner and in about the proportions herein specified.

78,731.—BREAST PUMP.—William T. Fry, New York city.

I claim a breast pump in combination with an india-rubber breast shield, when the latter is applied directly to the milk receptacle of the former, and all arranged substantially in the manner as and for the purpose set forth.

78,732.—BED BOTTOM.—E. Gibbs and O. W. Gibbs, Richland Center, Wis.

We claim an improved spring bed bottom formed by the combination of the cross slats D, staples F longitudinal spring slats, E, coiled wire spring, J, longitudinal spring slats G, wire loops, H, wound with cloth or its equivalent and cross slats I, with each other and with the side rails B, and end rails C, of the bedstead, substantially as herein shown and described and for the purpose set forth.

78,733.—APPARATUS FOR TURNING WRIST PINS, CRANK PINS, ETC.—Theodore A. Goff, San Francisco, Cal.

I claim the arrangement of the several parts of the machine as herein recited, whereby it may be used to turn off a wrist pin or a crank pin in place, as set forth.

78,734.—SHEET METAL FOLDING MACHINE.—George H. Goldsmith, Waverly, Ill.

I claim, 1st, The cog wheel, E, bearing cam blocks, h, or other equivalent device, substantially as shown and described, for the purpose of operating the break bar, F, all as set forth.

2d, The arm, i, and stud, k, or the equivalent thereof, substantially as shown and described, in combination with the break bar, F, and cog wheel, E, all as and for the purpose set forth.

3d, The fluted roller, A, substantially as shown and described, in combination with the blade bar, I, break bar, F, and cog wheel, E, all as and for the purposes set forth.

4th, The channel, l, of the blade bar, I, substantially as shown and described, and for the purpose specified.

5th, The pinion, D, and cog wheel, E, substantially as shown and described, in combination with the roller, A, break bar, F, and blade bar, I, all as and for the purpose set forth.

78,735.—HORSE HAY RAKE.—E. R. Hall, Utica, N. Y., assignor to himself, D. M. Golden, and B. G. Eaton.

I claim, 1st, Levers, m and n, in combination with the stop, b, substantially as and for the purpose specified

2d, Main lever, H, constructed and operating in connection with rake shaft, F, substantially as set forth.

3d, The combination of levers, m and n, with lever, H, substantially as described.

4th. The employment, in a horse hay rake, of foot lever, T, in combination with pawl, S, and connecting rod, P, substantially as and for the purpose specified.

78,736.—PAD BILLET.—Lydia Hays, Ames, Iowa.

I claim a metallic pad billet, B, having the buckle, E, attached, as shown, and secured to the leather strap, A, by the screws, C C, substantially as shown and described.

78,737.—SLEIGH.—Chester Heald, Marshalltown, Iowa.

I claim a wrought or malleable iron knee a a b, when welded to a cast iron runner so as to form braces, and to equalize the weight of load on all parts of the runner, substantially as shown and described, in combination with a cross beam plate H, runners, A, cross beams, D D, all substantially as shown and described, and for the purpose set forth.

78,738.—PRESS.—Henry Henley, New Garden, Ind.

I claim 1st The beam, b, hinged at, n y and secured in an adjustable manner to upright, d, by means of stirrup r, (or its equivalent,) substantially as set forth and for the purpose specified.

2d The flexible rods, e and e', in combination with the uprights, d and d', and beam, b, substantially as set forth, and for the purpose specified.

78,739.—PROPELLER.—D. H. Heyen, New York City.

I claim, 1st, The combination of the propeller wheel, C, and shaft, D, when adjustable laterally upon the central pivot, E slotted segmental plate F, support, G, pinion, h, upon the upright shaft, J, engine shaft, O, pulley, P, and pulley, R, all arranged as described for the purpose specified.

2d, The combination of the propeller, C, shaft, D, having the ball joint, E, slotted segment, F, and pinion, h, upon the shaft, J, all constructed and operating as and for the purpose specified.

78,740.—COOPERS' CROZE.—John C. Hofer, Belle Air, Ohio.

I claim the bit, A, formed in two parts, having the alternate corners of their forward ends bevelled or ground off, said parts secured to each other and to the guide B, by the slotted clamping bolt C, as herein described, for the purpose specified.

78,741.—NURSING NIPPLE.—Francis H. Holton, Brooklyn, N. Y.

I claim, 1st, The India rubber nipple, having the annular or circumferential stop flanch, constructed in one piece therewith, substantially as and for the purpose specified.

2d, The hollow flanch, b, for attaching the nipple to the tube, by means of the perforated button B, substantialy as shown and described.

78,742.—HEATING DEVICE FOR CHAIRS, ETC.—C. S. Hunt, Parish of Terrebonne, La.

I claim a chair, constructed substantially as herein described, that is to say, provided with the metal bottom, and the combustion chamber, adapted to receive a gas jet or its equivalent, substantially as and for the purpose described.

78,743.—APPARATUS FOR DISTILLING WOOD.—Gaspar Hunziker, Summit, Miss.

I claim, 1st, The oven A, constructed as described, having the rounded lower edges, and the central longitudinal inclined trough G, whose inclined wings, a, support the vertical strips and rails e, for the carriages C, the inclined plates a', above the wings a, the cold air pipes y, beneath said inclined wings, and between the flues F, the top of said oven provided with the condensing dome T, all arranged as described, for the purpose specified.

2d, The arrangement of the furnaces K, inclined flues F, trough G, cold air pipes y, draft pipes h, steam pipes i, hot air chambers M, and carriage supporting rails e, as herein described, for the purpose specified.

3d, The door P, provided with a track upon its inner side, whereby, when it is swung down in a horizontal position, it receives the carriages C, which are rolled out upon it to discharge their loads, as herein shown and described.

4th, The furnace flues F, when arranged to pass beneath the curved bottom of the oven A, upon each side of the projecting trough G, and curved outward extend in an inclined direction upon each side of said oven to the front thereof over the furnaces, to unite in the chimney S, as herein described, for the purpose specified.

78,744.—SHINGLE MACHINE.—Lyman Jennings, Winchendon, Mass.

I claim the combination of the horizontally sliding cutters g g g, and the rack c, with the wheels l l, pinions d d, racks k k, for operating the sliding block rest D, as described.

78,745.—TOP.—Chester L. Johnson, Utica, N. Y.

I claim the top A, and casing C, constructed substantially as described.

78,746.—VISE.—F. B. Johnson, De Witt, Iowa.

I claim, 1st, The elbow shank C, and movable jaw E, constructed and arranged substantially as herein shown and described, in combination with each other, and with the stationary jaw A, and clamping screw D, as and for the purpose set forth.

2d, The combination of the spring F, with the elbow shank C, and with the pivoted movable jaw E, and screw D, arranged substantially as herein shown and described, and for the purpose set forth.

78,747.—MACHINE FOR ENAMELING MOLDINGS.—John Johnson, Boston, assignor to himself and N. A. Brickett, Quincy, Mass.

I claim, 1st, The brushes G, mounted upon the vertical shafts E, one of which is adjusted laterally by the screw F, and both bearing beneath the brushes the disks H, arranged in relation with the vertically adjustable brush L, as herein described, for the purpose specified.

2d, The combination of the furnace P, feed rollers B U, brushes G G L, and laterally adjustable scraper N, all arranged and combined to operate in the manner substantially as and for the purpose set forth.

3d, The combination of the furnace P, brushes G G L, elastic roller B, feed roller U, scraper N, and guides T V, all arranged as described, for the purpose specified.

78,748.—HOLLOW HEADED SCALE BEAM.—Joel F. Keeler, Pittsburg, Pa.

I claim, 1st, Adapting hollow headed scale beams, of any known construction, to use as primary levers in the construction of compound lever platform scales substantially as herein described.

2d, The use of the combined link bearer f', and link f, in the construction and operation of platform scales, substantially as described.

78,749.—CHURN DASHER.—D. Dwight Kellogg, Jr., Northampton, Mass.

I claim a churn dasher, constructed with spiral rows of arms a a1 a2, etc., and strips M M' N N', attached to the arms, and arranged in combination with each other and with the shaft A, and the rows of arms, in the manner described, and for the purposes specified.

78,750.—SAW HORSE.—Frederic W. Mansfield (assignor to himself and H. C. Hitchcock), Fitchburg, Mass.

I claim the construction of the curved serrated levers A C, composing the clamp attachment, when arranged and adapted to be applied to a saw horse, in the manner and for the purpose herein shown and described.

78,751.—COOKING RANGE.—John McCloskey (assignor to Henry McGuckin), New York City.

I claim, 1st, Forming an air chamber across the back of the range, in communication with both the ovens of the range, substantially as described, so as to form a continuous oven and hot air space along three sides of the fire chamber.

2d, The gas combustion chamber, placed above the air chamber and beneath the smoke exit pipe, substantially as described.

3d, The boilers I, one or more, arranged over the ovens, so that they can be projected over the fire chamber, substantially as described.

4th, The bottom grate, when made in the form here shown, supported by journals at its ends, so that it may be taken out and turned upside down, thus enabling one to use it as a concave or a convex grate, substantially as described.

5th, Separating the divisions Q Q, of the water backs, by an air space, so that the temperature of the water in one will not affect the temperature of the water in the other, substantially as described.

6th, The inlet and outlet pipes in the annular air chamber that is placed between the water cylinders, substantially as described.

7th, Conducting the hot water pipe that leads from the water back to the inner cylinder V, through the outer cylinder U, and across the annular space W, substantially as described.

8th, Providing a range with staples a, or their equivalents, for the purpose of suspending it from a ceiling, as on shipboard, suostantially as described.

78,752.—CIRCULAR SAW GUIDE.—Thomas Milner, Houston, Texas.

I claim, 1st, The arrangement of the bolt C, within the plate A, the rods r r, working in the holes o o, acting in combination to operate the movable jaw K, as and for the purpose specified.

2d, The flange P, and shoulders, constructed and arranged to operate substantially as and for the purposes shown and described.

78,753.—BED BOTTOM.—Thomas B. Moore and Garrett De Bow, Bridesburg, Pa.

We claim, 1st, The slats B, of a bed bottom, joined together by a continuous webbing C, which also serves as the covering for the padding, substantially as and for the purpose described.

2d, The covering for the slats of bed bottoms, secured to the slats by means of the grooves in the edges of the slats, and the strips fastened therein, substantially as and for the purpose described.

3d, The rails of a bed bottom frame joined together by means of the metallic plate D, having the several lips and flanges described, and the betton a, substantially as and for the purpose set forth.

4th, The combination, with the slats B, and springs F, of the saddle E, substantially as and for the purpose described.

5th, The combination, with the springs and the rails, of the rod upon which the springs are wound, provided with the movable brackets G, and arranged in the said combination, substantially as and for the purpose described.

78,754.—ATTACHMENT FOR BAKE OVEN DOOR.—Smith Morton, Valparaiso, Ind.

I claim the application, to the doors of ovens, of a latch or catch, held immovable by the within described metal or metallic alloy while it is unfused, but which, when the said metal is fused, turns and unfastens itself, in combination with a weight or spring, to open the door, and the fusible metal and alarm on the inside of the oven, substantially as shown and described.

78,755.—DOBEREINER SELF-LIGHTING LAMP.—Gustav Muller, Newark, N. J. Antedated June 4, 1868.

I claim, 1st, Providing an inflammable lamp with a vertical or inclined channel c, substantially as described, for the purpose of preventing the accumulation of sulphuric acid in the channel, as set forth.

2d, Securing the spongy platinum of an inflammable lamp within a bell G, for the purpose of protecting the same, as set forth.

3d, A self-lighting lamp, when provided with a vertical or inclined channel c, and with a bell G, suspended above the outlet of the channel, all made and operating substantially as and for the purpose herein shown and described.

78,756.—BEDCLOTHES HOLDER.—John B. Munson, Bailey Hollow, Pa.

I claim, in combination with the cross bar F, secured to arms D d', which are hinged to staples E, fixed in the rail B, the cord H, pulley J, drum K, crank L, ratchet wheel N, and pawl M, all arranged to operate as and for the purpose herein set forth.

78,757.—ROPE TRACE.—Thos. Newman, New Orleans, La.

I claim, in combination with the rope trace A, the leather covering, metal clips B Cx and E, and the chain D, all arranged as described for the purpose specified.

78,758.—SOLE-EDGE PLANE.—Manly Packard, North Easton, Mass.

I claim as my invention or improvement in the sole edge plane the knife C, the throat piece D, and stock A, as constructed in separate pieces, and arranged together and combined by means substantially as described, so as to enable the knife to be adjusted with respect to the throat piece, and such throat piece be moved relatively to the knife, all as and for the purpose or purposes as explained.

Also, the arrangement and combination of the abutment or supporting projection c, the stock A, the adjustable knife C, and the throat piece D, movable relatively to the knife, as and for the purpose hereinbefore described.

78,759.—CAR BRAKE.—W. T. Parsons, Thomasville, Ga.

I claim, 1st, The combination of the flanged shoes S, pivoted to the lower ends of the bars D D', which are hung from the frame A, by means of pivots e e', with the shaft, g, bearing grooved pulleys P P' P, ropes or chains m m', drum d, and spring R, all constructed and arranged to operate in the manner and for the purpose herein set forth.

2d, The device for retaining the shoes S, in an elevated position, away from the wheels, said device consisting of the beveled pin b, fixed in the shaft g, centrally-pivoted lever L, having projecting pin i, and spring u, all constructed and arranged to operate in the manner substantially as herein set forth.

3d, The flanged shoe S", hung to the lower end of the single bar D", which is connected to the pivoted lever L', by a yielding joint, substantially as described.

4th, The combination of the slotted shoe S, pivoted bar D"', lever l, pivoted at g, and springs v v", all constructed and arranged to operate in the manner and for the purpose substantially as herein specified.

78,760.—RETORT FOR CONCENTRATING SULPHURIC ACID.—J. D. Perrin and Joseph Saunders, Brooklyn, N. Y.

We claim providing a retort with a projecting pipe or spout a, and with a pipe E, substantially as described, so that communication between various retorts can be established, as herein specified.

78,761.—GIB.—Amos H. Rhodes, Fall River, Mass.

I claim the construction and arrangement of gib A1, removable block B1, and bolts D1 and E1, operating substantially as and for the purpose set forth and described.

78,762.—WAGON AND CARRIAGE BRAKE.—Rodney Rice, Pittsfield, Vt., assignor to himself and J. H. Spaulding.

I claim, 1st, The treadle c, levers b b, and links a a1, in combination with the brake levers F F1, arranged and operating substantially as described.

2d, The brake levers F F1, provided at their inner ends with interlocking hooks, f, working in the loop G, substantially as and for the purpose described.

3d, The independently-hinged brake levers F F1, connected centrally by a sliding or hook joint, and operated by means of levers and connecting links, arranged substantially as described.

78,763.—EXPANDING PULLEY.—Thomas H. Savery, Wilmington, Del.

I claim the expandings C, of a pulley, operated by means of a hand wheel E, and scroll disk A, both working on the pulley shaft D, and connected by any suitable train of gear wheels, substantially as shown and described.

78,764.—VALVE GEAR FOR STEAM ENGINE.—Austin Seely, Alton, Ill.

I claim, 1st, The additional throttles T, arranged with reference to both cylinders, substantially as shown, for the purpose of operating the engines and controlling and modifying the expansion of the steam used, all as set forth.

2d, The expansion of cylinder B, in combination with the additional throttle T', substantially as and for the purpose shown and described.

3d, The additional throttle valves T' T", arranged in the pipe connections, substantially as shown and for the purpose specified.

78,765.—BRICK MACHINE.—D. Smith, Newburyport, Mass.

I claim, 1st, The annular series of open molds, l, operating in combination with arms j k, substantially as described.

2d, The intermittent rotary series of presses m o, constructed and operating in combination with the follower n, substantially as described.

3d, The combination and arrangement of the annular series of molds l, and the intermittent rotary series of presses m o, constructed and operating substantially as described.

78,766.—SKAKER FOR THRASHING MACHINE.—John P. Smith, Claverack, N. Y.

I claim, 1st, The rotating shaking arms f, in combination with the endless carrier or shaker B, substantially as and for the purpose specified.

2d, The arrangement of the shaking arms f, transverse shaft e, endless carrier or shaker B, and framing A, substantially as and for the purpose specified.

78,767.—MUSKETO SCREEN.—Edward Spaulding, Brooklyn, N. Y.

I claim so constructing and arranging the spring H, with the roller F, and screw bearing o, that the uncoiling force of said spring is exerted to tighten the bearings, and the contractile force to keep the screen in place and permit its removal when required, substantially as described.

78,768.—MILLSTONE DRESS.—Hedges L. Spencer, Social Circle, Ga.

I claim the millstone dress composed of the furrows a b c, formed and arranged as herein shown and described.

78,769.—MANUFACTURE OF AUGERS AND BITS.—Jas. Swan, Seymour, Conn.

I claim, 1st, The rising and falling and partially rotating arbor H, provided with the swaying and drawing dies J J, in combination with the holding dies B B, all arranged substantially as and for the purpose set forth.

2d, The comoination of the cam, N, bevel wheels K L, pins d e, arbor H, and the spring I, all arranged to operate the arbor in the manner substantially as and for the purpose set forth.

78,770.—COMBINED SQUARE AND BEVEL.—H. G. Taylor, Port Hope, Canada West,

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I claim a combined square and bevel composed of a stock formed of two parts A A', connected by a screw and nut, B and a blade, C, fitted between said parts, and connected with part A, all arranged substantially as shown and described.

78,771.—IMPLEMENT FOR SHARPENING CUTLERY.—Augustus Thayer, Albany, N. Y.

I claim, 1st, The cutters C, two or more, constructed as shown, with beveled ends, and fitted in a slot in a tang B, and secured therein by a screw or wedge, substantially as and for the purpose set forth.

2d, The grooves d, in the ends of the cutters, for burnishing or hardening the cutting edges, substantially as set forth.

3d, The beveled shoulders c, in combination with the cutters C, substantially as and for the purpose specified.

4th, The sliding or adjustable tube E, either with or without the polygonal plate, F, substantially as and for the purpose set forth.

78,772.—SASH FASTENER.—Ralph Thomas (assignor to himself and E. Parker), Waterbury, Conn.

I claim a sash fastening consisting of the case A, and spring bolt C, in combination with the hinged cap D, all made and operating substantially as herein shown and described.

78,773.—WINDMILL.—G. J. Thorn, Pecatonica, Ill.

I claim, 1st, The windmill having each of its arms, B, provided at opposite ends with wings, C, placed at right angles to each other, said arms passing in different vertical planes through the vertical shaft A, and through openings, a1, in the sleeve E, all arranged as described, for the purpose specified.

2d, The sleeve E, suspended upon the shaft A by the rods F, attached to the arms of the governor, and provided with a series of openings, a1, in different vertical lines, for the passage of the arms B, and for the operation of the cams a2, as herein described, for the purpose specified.

3d, The device for changing the position of the wings C, consisting of the V-shaped cranks a2, upon arms B, and the V-shaped openings a1, in sleeve E, substantially as shown and described.

78,774.—HORSE HOE.—Elisha W. Walton (assignor to himself and Wm. H. Derrick), Stockton Cal.

I claim, 1st, The regulating brace m, constructed substantially as and for the purpose above shown.

2d, The standard E E of a horse hoe, constructed substantially as above described.

3d, The reversible hoe point, D, with its slot or mortise X, constructed and operated substantially as above shown.

4th, The reversible shares A, and also their two sharp cutting edges, constructed and operated substantially as above shown.

5th The moldboard B in combination with the share A, substantially as above shown.

6th, The wedge, L, with its screw and nut, constructed and used substantially as and for the purpose above described.

7th, A horse shoe with or without the mold board B, constructed and operating substantially as above described.

78,775.—CLEVIS IRON.—T. P. Warren, Norfolk, Va., assignor to D. W. Warren

I claim 1st, The combination of the perforated plate, D, with the bent rod C, when the said parts are constructed to operate in the manner set forth.

2d, In combination with a perforated draft plate D, and a rod or link C, for attaching it to the plow beam the screw nuts n n by which the plate can be adjusted back and forth on the rods or link so as to cause the plow to run more or less to land, in the manner described.

78,776.—CAR AXLE CAP.—William Werts, Pana, Ill.

I claim 1st, The combination of the eye bolt, D, coiled spring F and chamber E, with each other with the door B and with the cap or box A, substantially as herein shown and described and for the purpose set forth.

2d, The combination of the cross-head bolt G, coiled spring I, and chamber H, with each other with the notched or grooved slotted projection b3, formed upon the door B, and with the cap or box, A, substantially as herein shown and described and for the purpose set forth.

78,777.—REFRIGERATING MILK CAN.—W. W. White and Martin King, Lowville, N. Y.

We claim the combination of the jacket A B, and cylinder D, together with the hollow lid H, the ventilating tube J, and the connecting tube E, substantially as specified and for the purposes therein set forth.

78,778.—DOUGH KNEADER.—C. I. Wilmans and W. J. Wolfe, Olney, Ill.

We claim, 1st, The combination of the pivoted kneader M m P, the stationary kneading board P', and curved bottom H, all constructed, arranged, an operating as described for the purpose specified.

2d, The adjustable roller Q Q', arranged and operating in combination with the kneader P, substantially as specified.

3d, The removable covers L L', in combination with the sliding frame W, and hooks X, substantially as and for the purpose set forth.

4th, The removable kneading board P', in combination with the groove a3, roller Q Q', and kneader M P, for the purpose set forth.

5th, The relative arrangement of the compartments C D E, removable partition F, stationary partition G, bottom H I, and cover K, substantially as and for the purpose set forth.

78,779.—JACQUARD FOR LOOMS. — Moritz Wolf, Philadelphia, Pa.

I claim, 1st, Operating the cylinder A, by means of the cylinder F, needles o, strings l, slotted extension p, of the lifter D', and frame K, all made and operating substantially as and for the purpose herein shown and described.

2d, Two or more independently acting cylinders, in combination with the vertical needles, substantially as described for the purpose specified.

78,780.—COMPOSITION FOR GILDING MOLDINGS, ETC.—David Wright, Boston, Mass.

I claim the preparation or compound for preparing frames, moldings, ceilings, and all surfaces for gilding in gold and silver, substantially as set forth and described.

78,781.—STEAM AND WATER-INDICATOR FOR BOILER.—Thos. P. Akers, New York city.

I claim, 1st, a low-water and high-pressure indicator, in which the adjusting-parts are so constructed and arranged as to be locked in their adjusted position, independent of any covering or other surrounding devices, substantially in the manner shown and described.

2d, The combination of the expansible tube, A, with the levers, I and K, the jointed lever, L, and the part M, together with their connections and fastenings, substantially as and for the purpose set forth.

3d, The combination of the inverted valve, Y', the valve-stem, Y, the nut, X, the cap, G, the spiral spring, W, and the whistle, E, substantially as shown and described.

4th, The tube, A, and the levers, I, K, and L, with their connections and fastenings, when combined with the inverted valve, Y', the valve-stem, Y, the nut, X, the cap, G, and the spiral spring, W, whereby to produce the double effect of indicating low water and excessive pressure of steam, substantially as herein set forth.

78,782.—GOVERNOR.—William Bellis, Richmond, Ind.

I claim, 1st, The construction of the triple-disk valve, I J K i j k, substantially as and for the purpose set forth.

2d, The diaphragm, D d E F f G H, constructed as described, when arranged in relation to the triple-disk valve, I J K, substantially as and for the purpose specified.

3d, The combination of the adjustible bracket, S, weighted prop or latch, R r, and weighted lever, P p, with the governor valve, I J K, and governor, N, all constructed, arranged, and operating substantially as and for the purpose described.

78,783.—PORTABLE FENCE.—Louis W. Bosart, St. Marie, Ill.

I claim, 1st, In combination with the panels, the gate-posts, D, constructed and arranged substantially as and for the purpose set forth.

2d, The trestles, C, with slots and notches, c'', and projections, c', in combination with the panels, A and A', suostantially as described.

78,784.—CAST-METAL BRACKET —Purmort Bradford (assignor to Sargent & Co.), New Haven, Conn.

I claim the base, A, shelf, B, and brace, C, constructed so as to be united and locked together by hooks or projections on one part, and corresponding mortises or recesses in the other, so that when the three parts are set together, they will be locked and held in place, substantially as set forth.

78,785.—PLOW.—Chas. Brown and Leonidas Gerth, Peoria, Ill.

We claim a combined plowing and cultivating machine, having levers, B and F, with ratchets thereto, rod, C, chains, D, knives, G, frames, H, P, and O, and swinging bars, M, constructed, arranged, and operating substantially as specified.

78,786.— PROCESS OF COMBINING WROUHT AND CAST METAL. —Edward L. Brown, Philadelphia, Pa.

I claim, 1st, Preparing wrought metal for combining it with cast metal for castings of all descriptions, where great strength of any kind is required, by first thoroughly coating it, by galvanic action or other process, with nickel, or any other metal or metals, alloys of metals, or metallic or mineral substances, or their alloys, not easily oxidizable and very difficult to fuse, and which only melt, or whose point of fusion is at a higher degree of heat than the molten cast metal to be poured about it, the whole substantially as above described.

2d, The production of castings strengthened by the introduction of wrought metal coated with a metal, alloy of metals, or substance less fusible than the cast metal, substantially as above set forth.

78,787.—HOP-POLE.—Williston Conner, Rensselaerville, N.Y.

I claim the combination of the large and small rings, B B', constructed as described, that is to say, each having three openings, a, on the outer parts, and one central opening with teeth, and used with the poles. A and C C C, as and for the purposes specified.

78,788.—HYDROCARBON BURNER.—Alphonso W. Cook and Robert Dempster (assignors to themselves and J. S. Semon), Buffalo, N.Y.

We claim, 1st, The coil of pipe, G, in combination with the feed-pipe, F, and retort, A, arranged and operating substantially as and for the purpose described.

2d, The dripping-pan, H, and discharge-pipe, h1, in combination with the feed-pipe, F, and retort, A, for the purpose and substantially as described.

3d, The plate, C, having openings, C1 and C2, in combination with the furnace, B, draught-flue, E, and retort, A, constructed and arranged substantially as herein set forth.

4th, The removable bottom plate, M, in combination with the retort, A, for the purpose and substantially as herein described.

5th, The annular air-chamber, n, and outlet, n1, in combination with the retort, A, for the purpose and substantially as herein described.

6th, The chamber, I, plugs or bushings, i1, and strainer, J, in combination with the feed-pipe, F, for the purpose and substantially as herein described.

7th, The combination of the force-pump, P, feed-pipe, F, and blow-off pipe, L, for the purpose of cleaning the inside of the retort, A, substantially as described.

8th. The application and use of the apparatus herein described, for generating steam, in the manner and for the purposes substantially as herein set forth.

78,789.—PORTABLE FENCE.—Wm. Corson, Camden, Ohio.

I claim the flexible bar, D, in combination with the bar, C, and notch, c, substantially as described.

78,790.— WEATHER-STRIP.—Japheth Cross, Adrian, Mich.

I claim, 1st, the combination of the strips, a, b, c, and d, with the bed-pieces, f and h, to be used in doors and windows, all constructed in the manner and for the purposes substantially as set forth.

2d, The combination of the spring-catch, k, with the levers, l, and strip, b', constructed and operating in the manner set forth.

78,791.—CHURN.—Samuel T. Curtiss (assignor to himself and Lyman P. Thompkins), El Paso, Ill.

I claim the dasher, F, constructed and arranged to operate substantially as and for the purpose herein set forth.

77,792.—GRAIN-DRILL.—Daniel L. Dickson, Durham, Ill.

I claim the arrangement of the shaft, F, in the box, J, and provided with a series of wheels with circumferential grooves, in combination with the fluke-bars, O O, that extend under the hopper to the flanged roller, C, the various parts being constructed and operated substantially as specified.

78,793.—SUBAQUEOUS FOUNDATIONS.—James B. Eads, St. Louis, Mo.

I claim the combination and arrangement of the outer caisson, its ribs or posts, B B', with the internal caisson, C, in the manner and for the purpose substantially as herein set forth.

78,794.—HAWSER CLAMP.—Henry A. Ellis and C. Frederick Gladding, Norwich, Conn.

We claim the double cam-shaped lever, L, in combination with the moving jaw, C', when operating through the guide, G, and pin, p, substantially as described and for the purpose set forth.

78,795.—WATER-METER.—Henry Flad, St. Louis, Mo.

I claim the air-check in the chambers, A, C, and D, to prevent the flow of liquid in any direction but that of the line of traverse of the piston, substantially as set forth.

The combination of the magnet, E, the soft bar, e, and the revolving piston, B', when acting substantially as set forth.

78,796.—ATTACHING HANDLES TO CUTLERY.—James Flood, New Haven, Conn., assignor to Wm. Sanderson, New York city.

I claim the employment of the twisted tang, in combination with the composition handle molded around, all substantially as described for the purpose set forth.

78,797.—TRUSS-FRAMED BRIDGE.—John Foreman, Pottstown, Pa.

I claim the arrangement, substantially as described, of the inclined posts, suspension-rods, and diagonals, for the purpose specified.

78,798.—CASTER FOR FURNITURE.—Elliott E. Furney, Chicopee, Mass.

I claim, 1st, The lower plate, g, of a caster, when constructed with the elongated curved projection, g, thereon, and having the projection or bearing, m, said plate, g, being used in connection with the spindle, B, and roller, D, when constructed and operating substantially as described, and for the purposes herein specified.

2d, The combination of the plate, g, having a spindle, B, with the circular lever, d, said lever, D, operating in conjunction either with the plate, b, or with the furniture to which the caster may be attached, all constructed and operating substantially as herein described and for the purposes specified.

78,799.—CULTIVATOR.—George Garrett, Elkhart City, Ill.

I claim providing a double cultivator with a fender, F, having bearing chains, f f, when the same are united and combined with the beams, B and C C, and the whole is so constructed and arranged as to operate substantially as described and for the purpose specified.

78,800.—HARVESTER.—Wm. F. Goodwin, East New York, N. Y., assignor to himself and Charles R. Squire, New York city.

I claim, 1st, The employment of a cam or eccentric, in combination with the multiplying gear, shown and described, for the purpose set forth.

2d, The cam, A, attached to the pinion, A2, or a sleeve projecting from the latter, and working on and rotating round the shaft, H, of a harvester, in the manner and for the purpose substantially as described.

3d, The arrangement of the hoisting apparatus of a harvester, whereby the cutter-bar may be drawn up and turned over on the tongue, in combination with the retracting-spring, E, arranged and operated in the manner and for the purpose substantially as described.

78,801 —HORSE-RAKE.—C. N. Goss, Claremont, N. H.

I claim, 1st, The arrangement of the two pivots or centres, D d, upon which the tooth-bars turn in the described relation to each other, and to the shafts or thills, for the purpose set forth.

2d, The arrangement of the stop-bar, I, relative to the tooth-bar pivots, D d, substantially as and for the purpose set forth.

3d, The arrangement of the rock-shaft, D, substantially as described, whereby it is made to constitute the rest or support of the independently-pivoted tooth-bars, as well as the common centre upon which said tooth-bars are vibrated to discharge the gathered load.

4th, The levers, H and L, in combination with the pivoted tooth-bars and step-bar, I, substantially as described, whereby the driver is enabled to hold the teeth down to their work, and to raise the same for discharging the load, or for passing an obstruction, as set forth.

5th, The coil-spring, G, applied to and operating in combination with the rake-bars and pivoted rake-teeth, substantially as and for the purpose set forth.

78,802.—BRICK-DRYING APAARATUS.—Isaac C. Hatch, Camden, N. J.

I claim one or more kilns, built as herein described, and provided with hot-air or steam pipes P P', in combination with fans, F, within the rear end of each kiln, all constructed, arranged, and operating as and for the purpose herein set forth.

78,803,—TOOL FOR REJEWELING WATCHES.—C. Hopkins, Philadelphia, Pa.

I claim, 1st, The bed, A, having the clamp, a, and the centering screw, J, substantially as and for the purpose above described.

2d, Forming the ends of the reaming instrument, as shown at m m1, m2, substantially as and for the purpose set forth.

3d, The reaming tool above described, composed essentially of the bent spring-arms, G G, having the cutting-edges m m1 m2, and the exterior screw-threads, with the adjustible centering-needle, I, and the screw-nut, F, working up and down upon the arms, G, G, in the manner described, all said parts being constructed and arranged to operate together substantially as specified.

78,804.—COMPRESSION-COCK.—Cornelius A. Howard (assignor to himself and Richard McCloy), New Haven, Conn.

I claim, 1st, The valve, C, constructed with the passage, and arranged within the chamber, B, and combined with the plug, D, when the said plug, D, is arranged so as to operate the said valve to close the inlet at one extreme, and the plug at the other, and open at intermediate positions, substantially in the manner herein set forth.

78,805.—SPRINKLER AND DREDGE.—George Jones, New Haven, Conn.

I claim the arrangement of the ball-joint between the spindle, D, and plunger, C, and combined with the cover, B, and cup, A, so that the cover, may be turned from the cup, substantially as herein set forth.

78,806.—MANUFACTURE OF IRON AND STEEL.—John Allcock Jones, Middlesborough, England.

I claim the preparation of iron and the production of cast steel, by first submitting cast or pig iron to the processes of puddling, boiling, and balling, and then submitting the balls so obtained, either whole or in fragments, to fusion in separate crucibles or receptacles.

78,807.—SIDE-SNAP FOR HARNESS.—John Kerr and Dayton C. Kerr assignors to themselves and S. H. Miller, Ames, Iowa.

We claim the adjustable snap-hook, D, in combination with the metal plate, A, and socket, B, all constructed and arranged substantially as herein described, for being attached to the pad of the saddle of a harness, as set forth.

78,808.—HORSE-POWER.—Walter King, Richmond, Mo. Antedated May 27, 1868.

I claim, 1st, A locomotive horse-power, A C D, in combination with a stationary machine, B B1 B2, substantially in the manner shown and described.

2d, The housing, A, when combined with the driving-shafts, C D1, and the wheels, C1 C2, substantially as shown and described.

3d, The wheels, C1 C2, the bosses, c1, and spring clutches, c2, when constructed and arranged as described and set forth,

4th. The pole, E, when formed of two pieces, e e1, and applied to the housing, A, so as to form a one-horse or two-horse machine, as described and shown.

78,809.—CHURN.—J. J. McLane, Sagetown, Ill.

I claim the arrangement of the box, A, with the metal bottom, B C, two cross shafts, D D, having movable arms, H H, and adjustable by the journals, j, and bearings, h, the several parts being constructed and operating substantially as specified.

78,810.—MACHINE FOR SCUTCHING FLAX.—Abraham S. Miller, Bluffton, Ind. Antedated June 5, 1868.

I claim the knives, O, upright, C E, base, D, and spring bar, F, all combined, constructed, and arranged as and for the purpose herein set forth.

78,811.—MACHINE FOR BREAKING FLAX.—Abraham S. Miller, Bluffton, Ind Antedated June 5, 1868.

I claim the guide, H, in combination with the break, I, constructed and arranged as and for the purpose set forth.

78,812.—CHURN.—Samuel Mills, Clinton, Ill.

I claim, 1st, The box, A B, constructed as described, and used while partially submerged in the cream, in combination with the wire gauze or perforated plate, C.

2d, The dasher, b c, provided with flaps, e, e, in combination with the box, A B, substantially as and for the purpose set forth.

78,813.—BEE-HIVE.—Freeman Moore, Carrollton, assignor to himself and J. H. Tressel, Carroll county, Ohio.

I claim, 1st, The movable bottom board, D, provided with a slide, r, in combination with the wedges, t, or their equivalent, when constructed and arranged substantially as and for the purpose specified.

2d, The slotted honey board, I, in combination with perforated pasteboard and fancy honey receptacles, K, when constructed and used substantially as and for the purpose herein set forth.

3d, The cover, R, when provided with a queen cage, 1 S, and slide, p, substantially as and for the purpose specified.

4th, Suspending the movable frames, f, and the dividers, &, by means of metallic hooks thereon, and the horizontal wire rods and braces, g, as and for the purpose herein set forth.

5th, The air chambers, m, and the double ventilators, o and n, in combination with the slides, u, when arranged and used as and for the purpose herein set forth.

6th, The comb guides, H, when constructed and used in the manner and for the purpose set forth.

7th, The dividers, &, when constructed and used in the manner and for the purpose set forth.

8th, The combination of the honey box, N, as constructed, with the pasteboard separator, and arranged in the hive, as and for the purposes set forth.

78,814.—GRINDING MILL.—John P. Moore, Morning View, Ky.

I claim supporting the lower edge of the bed stone, F, by means of the screw rod, H, nut, H2, and spring, I, arranged as herein described, for the purpose of giving elasticity to the bed stone in its relation to the runner.

78,815 —MACHINE FOR STUFFING LEATHER.—Henry Muller, North Cambridge, Mass.

I claim, in the process of stuffing leather, the employment, subsequent to treating the leather with oil in a warm close drum or wheel, of a wheel or drum, so constructed as to admit free access of the air to the leather, substantially as and for the purpose described.

Also, the wheel, with the close circumference, a, and skirting, b, the door, c, and cross-bars, d, when made open at the heads or sides of the wheel or drum, as and for the purpose described.

78,816.—HORSE HAY FORK.—Harvey D. Palmer, Leonidas, Mich., assignor to S. O. Kaempfer, David G. Williams, and William C Wilson, Elkhart, Ind.

I claim the movable head piece, F, to which the prongs, D, are pivoted, in combination with the standard, A, link, c', and rods, d', and, E, substantially as and for the purpose set forth.

78,817.—SEWING MACHINE.—Charles Parham, Philadelphia, Pa.

I claim the combination, with the bracket, of the carrier, driver bar, groove and feed wheel, as described, for the purposes set forth.

78,818.—SEWING MACHINE.—Chas. Parham, Philadelphia, Pa.

I claim, 1st, The combination of the shuttle carrier, T, the guide, V, the cam slotted down, hanging arm, S', directly attached to the carrier and the crank, M, the whole constructed and arranged substantially as described.

2d, A shuttle driver or carrier, S, having a downwardly hanging arm, S', in combination with a guide, V, and groove, W, constructed and arranged substantially as described.

3d, A reciprocating shuttle face plate having feed teeth on its upper edge substantially as described.

4th, A reciprocating shuttle face plate, having feed teeth on its upper edge, in combination with a movable stripper plate, O, substantially as described.

5th, A reciprocating shuttle face plate having feed teeth on its upper edge, in combination with a movable stripper plate, O, and needle shield, E, substantially as described.

6th, The combination of a reciprocating shuttle face plate, having feed teeth on its upper edge, a movable stripper, O, and a reciprocating cam or wedge on the upper surface of the shuttle carrier or driver for the purpose of operating the feed stripper, substantially as described.

78,819.—HOT WATER TANK ON COOKING-STOVE.—Daniel E. Paris, (assignor to Burdett, Paris, & Co.), Troy, N. Y.

I claim, 1st, For the purpose of heating the reservior only, a double flue between the oven and the reservior, so arranged as to conduct the products of combustion downward in front of the back plate of the cooking-stove, and upward in the rear of it, substantially as here shown and described.

2d, A double acting damper, situated below or underneath the pipe-collar of a cooking stove, having its base at or near the back plate of the stove, while its top part shall move from side to side of said pipe-collar, in combination with the reservior in rear of and the double flue below said damper, substantially as herein shown and described.

3d, The back of a cooking-stove as a division plate for an upward and downward flue, or a double flue at the rear end of the same, in combination with a water reservior, when situated substantially as herein shown and described.

4th, A pipe-collar to a cooking-stove, situated at one side or end of the stove, and over or nearly over a double smoke flue and so placed that it shall receive the currents from either flue, as the damper below is shifted from side to side of said pipe-collar, substantially as herein shown and described.

5th, In combination with a water reservior, two flue dampers, both situated at one side or end of a cooking-stove or range, and arranged or capable of producing the results substantially as herein shown and specified.

6th, The upright flue, R, situated in rear of the back plate of a cooking-stove, connected and in combination with the flue chamber, K, and the pipe-collar, G, three sides of which flue are formed by the concave shape of the reservior, substantially as here shown and described.

7th, The rearwardly and upwardly projecting flue seat, K, or its equivalent when used to conduct the smoke or products of combustion from the rear flue or flues of the stove into the flue, R, or into a similar flue formed in or near the centre of the reservior, substantially as herein shown and described.

78,820.—HORSE-HAY FORK.—Edward M. Parker, Sion, Md.

I claim a hay fork or elevator, when the same is provided with two straight tines, in combination with a centre tine, or curved formation, the latter being controlled by a crank lever with a suitable bearing pin.

78,821.—BUTTON-HOLE STITCHING MACHINE.—Rufus H. Peabody, Chelsea, Mass.

I claim the combination, with a clamp substantially as described, of a spreader lever projecting backward from the nub, d, and constructed and operating as and for the purpose described.

Also, in combination with said clamp and lever, g, the device for securing said lever in any desired position within the range of its movement, for the purposes described, consisting of the teeth, n, and stationary pawl, m, or their equivalent.

78,822.—COAL COOK-STOVE.—Henry Pease, Brockport, N. Y.

I claim the combination and arrangement, with the oven, B, and central fire-pot, E, of the hot-air flue, a, surrounding the oven and the cold-air flue, i, surrounding the fire-pot, the effect being to equalize the temperature of the oven by shielding from over heat and cold, as herein set forth.

78,823.—BOILING KETTLE.—H. H. Pember, New York, city.

I claim a vessel, provided with a channel, B, around its upper edge, which communicates with the interior of the vessel by means of apparatus, E, as described, and for the purpose specified.

78,824.—HORSE-RAKE.—Lorenzo D. Pennington and John G. Woodhill, Vernon, Ind.

We claim, 1st, The bail, C, rod, g, and bolts, K and m, with the slot, c, in the continuation of the band, n, or their equivalents, when arranged to operate substantially as and for the purpose specified.

2d, In combination with the bail, C, rod, g, and bolts, K and m, and slot, c, the spring, D, and studs, a a, all arranged to operate in the manner and for the purposes as set forth.

78,825.—FORGING APPARATUS.—Nelson Peterson and George W. Jones, Antioch, Cal.

We claim, 1st, The bar, H, with its slotted lever, N, screw, P, and spring, I, in combination with the link, J, and the handle, B, substantially as described.

2d, The bearings, E, having the recesses, a a a, for supporting the axle D, so as to allow the hammer to be used on any part of the anvil, substantially as described.

78,826.—SHADE FIXTURE.—George T. Pillings, (assignor to himself and John W. Massey,) Leicester, England.

I claim the combination and arrangement of the frame, B, provided with eyes, e and e', worm, W, circular rack, R, and pulley, L, so as to operate substantially in the manner and for the purpose specified.

78,827.—SHAFT COUPLING.—T. W. Porter, Boston, Mass.

I claim, 1st, A shafting coupling, divided longitudinally in halves, as shown at, A and A, and secured together by bolts passing outside the shaft, as shown at, i i', and with the spline or key, a, or its equivalent, formed upon or inserted in the coupling, substantially as described and shown.

2d, The plane bearings, h, formed in a longitudal divided coupling, substantially as and for the purposes specified.

78,828.—GAS GENERATOR.—D. Webster Ranke, Limestoneville, Pa. Antedated June 4, 1868.

I claim the gas generator, constructed as described, consisting of the annular reservior, A, in the inner side of which the curved pipe, c, is secured, its base extending within the reservoir, above the level of the oil, and the burner upon its end extending to the central opening in the reservior, A, and provided with the protector, E, the perforated deflector, B, above the reservior, and the supply pipe, D, all arranged as described for the purposes specified.

78,829.—HOISTING MACHINE.—Henry J. Reedy, Cincinnati, Ohio.

I claim, 1st, The combination substantially as described, with a hoisting platform, of the suspending rope, E, weights, H H', rollers, d, sheaves, F F', and shaft, G, or their mechanical equivalents, by which the platform is both balanced and enabled to be elevated and depressed in the manner explained.

2d, The arrangement, substantially as described, of the shaft, P, ratchet wheel, R, rubber, S, lever, T, and pawl, U V, or their mechanical equivaleuts, for the purposes set forth.

78,830.—ICE CRUSHER.—Nathan Richardson, (assignor to "The Richardson Mill Company,") Gloucestor Mass.

I claim, in an ice-crushing mill, the vibrating teeth or spikes, M M M, &c, operated by cams, D D', or their mechanical equivalents, in combination with the tooth crushing wheels, substantially as described and for the purposes set forth.

78,831.—PROCESS OF TREATING GOLD AND SILVER ORES.—Louis Edward Rivot, Paris, France, assignor to Jacques Gaillardson San Francisco, Cal.

I claim 1st, The roasting by means of superheated steam, of auriferous and argentiferous ores, when previously combined or mixed with oxide of iron substantially as set forth.

2d, The roasting of auriferous and argetiferous ores by mixing therewith oxide of iron, combined with iron or roasted pyrites, and then submitting the whole to the action of superheated steam, substantially as set forth.

78,832.—JOURNAL BOX.—James T. Robinett, (assignor to himself and G. W. Goodwyn), Petersburg Va.

I claim the method of attaching the brass plate, C, to the iron piece, A, as herein set forth.

78,833.—SEEDER AND CULTIVATOR.—J. S. Rowell, and Ira Rowell, Beaver Dam Wis.

I claim, 1st, The combination of the hollow axle and end piece of frame arranged as set forth, to form a bearing and end piece.

2d, The spindle, D, secured firmly in the hub of the driving wheel, to form a double bearing for the same.

78,834.—CONSTRUCTION OF HANDLES OF TABLE CUTLERY.—William Sanderson, New York, city.

I claim forming the handles by molding a suitable composition, under pressure, around the tang or metallic portion of the instrument, substantially as herein before set forth.

77,835.—MACHINE FOR STUFFING LEATHER.—Joseph. W. Schayer. Boston, Mass.

I claim, in combination with a stuffing-wheel, a heating-apparatus placed in a chamber, h, auxiliary to and opening into the stuffing-wheel, but separated therefrom by an open work or perforated partition, m, substantially as described.

Also, combining with a rotary stuffing-whel an axial pipe, through which oil may be thrown into the stuffing-chamber while the wheel is in rotation, substantially as described.

78,836.—CARRIAGE-TOP.—E. S. Scripture, Brooklyn, N. Y.

What I claim as new, and desire to secure by Letters Patent, is, not the circular corrugated wedge friction surfaces as when made by themselves, as the same as has been made by me, and described in my patent, dated January 7, 1868, for compasses, calipers, etc.; but,

I wish to claim their application, as described, when combined with a carriage-seat and top, substantially in the manner and for the purposes set forth.

78,837.—MACHINE FOR PLACING FRICTION MATCHES IN FRAMES FOR DIPPING.—George Sebold, Durlach, Germany, assignor to John F. Zisemann and Heinore Rashcol, St. Louis, Mo.

I claim 1st, The receiving or feed-box, I, arranged with longitudinal plane ridges, i1, having transverse projecting slats, i2, substantially as set forth.

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2d, The pressure-slide, K, actuated by ropes and weights, in combination with the feed-box, I, substantially as and for the purpose set forth.
3d The guide-tube box, F, and its tubes, f2, the sieve, G, and check-sieve, H, substantially as for the purposes set forth.
4th, The boxes, I, and, F, in combination with the axle, f1, the shaking-lever, N, and pivot, n3, substantially as set forth
5th, The guide-slat frame, E, having longitudinal slats, e', in combination with the splint-frame, D, having transverse slats, d1, and the channel-plate, B, substantially as for the purposes set forth.
6th, The splint-frame, D, arranged with slats, d1, chamfered at ends, substantially as set forth.
7th, The spaces, c, in combination with the slats, d1, of the frame, D, constructed and operating substantially as set forth.
8th, The compresser device, Q, acting upon the slats of the frame, D, substantially as and for the purpose set forth.
9th, The supporting-bar, L, in combination with the shaking-lever, M, and shaking-wheel, m1, acting substantially as set forth.

78,838.—APPARATUS FOR DAMPENING GRAIN.—I. Shellabarger, Decatur, Ill.

I claim the combination and arrangement of the cylinder, A, grain chute, B, and water pipe, c', when the whole is constructed so as to operate substantially as described.

78,839.—UMBRELLA AND PARASOL.—John Anderson Simpson, Liverpool, England.

I claim, as a new article of manufacture, an umbrella constructed as herein described, the joints or junction of the ribs and stretchers being covered, and protected from injuring the covering by rubber shields, as and for the purposes herein set forth.

78,840.—SOAP.—G. W. Slagle, J. L. Miller, and H. C. Hoy, Washington, D. C.

We claim the mode of manufacturing soap from the ingredients, and substantially in the manner set forth.

78,841.—WAGON-BRAKE.—James Harvey Smiley, Caroline, N. Y.

I claim the combination and arrangement, consisting of the slide, C, the cord or cords, F, levers, G, and H, and springs, P, and pulleys and rollers, and plates, as described, making a brake sliding out and against the wheels, and retracting out of sight, substantially as set forth.

78,842.—ARTIFICIAL IVORY.—Alfred Starr and William M. Welling (assignors to William M. Welling), New York city. Antedated June 2, 1868.

We claim the compound herein specified, prepared as set forth.

78,843.—COMBINED THRESHING MACHINE AND GRAIN-SEPARATOR.—Lorenzo P. Tweed, Lewisburg, Pa

I claim. 1st, The apron, F, consisting of a number of sheet metal strips, suspended above the shaker-frame, D, substantially in the manner and for the purpose herein set forth.
2d, The slats, y, having wires, y1, at their edges and adjustable upon a frame, substantially as and for the purpose described.
3d, A plate or plates, k1, so hung, adjacent to an opening in the case of a fan, G, that the passage of air into the said case will cause the plate to be adjusted, substantially as and for the purpose described.
4th, The arrangement of the shaker-frame, D, platforms, H and K, bands, g and w1, with their bars or scrapers, and the sieves, t t1, all substantially as and for the purpose specified.

78,844.—DEVICE FOR RAISING AND LOWERING WINDOWS.—Elisha H. Tobey (assignor to himself and A. R. Hale), Bridgeport Conn.

I claim, as an article of manufacture, the socket, A, constructed with the internal flange or rim, a, and with or without the flush-plate, B, and so as to be applied to the sash, substantially as set forth.

78,845.—ELECTRO-PNEUMATIC APPARATUS FOR TRANSMITTING DISPATCHES.—Cromwell,, Fleetwood Varley, London. England.

I claim, 1st, Operating the pistons and valves of the main compressed air and exhaust-pipes, o and n, by means of a series of auxiliary valves and pistons, and pipes connecting the exaust and compressed air chambers with the cylinder, and arranged to be operated by the keys or buttons, substantially in the manner and for the purposes herein set forth.
2d, The combination, with the valve-rods, M and l, and their detents, of the sliding-rod, 4, arm, 3, and piston-rod of the cut-off cylinder, V, substantially as herein shown and described.
3d, The combination, with the the cylinder V and its piston, of the cut-off mechanism herein described, arranged in such manner that either the depression of the stop or key, a', or the arrival of the carrier at the distant end of the message pipe, shall connect the said cylinder with the exhaust, substantially as and for the purposes herein shown and set forth.
4th, The use of the valves, x y, arranged in chest, N, so as to be operated by the movement of the arm, 3, for the purpose of destroying the vacuum in the chest and message-tube, as set forth.
5th The combination, with the message-tube, and mechanism for connecting the same with the air-compressing apparatus of the cylinder, F, and piston and slide-valve arranged to cut off communication between the message-tube and receiving-chamber, substantially as herein shown and set forth.
6th, Connecting the slide-valve. cylinder, F, with both the compressed-air and the cut-off mechanism, substantially in the manner and for the purposes specified.
7th, The combination, with the message-tube, of the herein described mechanism for connecting the same with either the compressed-air or exhaust-apparatus, and for cutting off the said connections, under the arrangement described, so that all the operative parts of such mechanisms shall be actuated by means of the button, A, a, and a', in the manner and for the purposes set forth.

78,846.—SEEDER, DRILL, AND ROLLER.—Luther R. Wallace, Adrian, Mich.

I claim, 1st, The employment of one hopper and one cylinder, or their equivalent, to supply both drill and broadcast-sower with the seed to be sown, the whole arranged in front of the rollers, B B, substantially as set forth and described.
2d, The hollow adjustable seed-cylinder, E, in combination with the concave, W, broadcast-tubes, L, and drill-tubes, N, substantially as set forth and described.

78,847. — BREECH-LOADING FIRE-ARM. — D. B. Wesson (assignor to Mason Fire-Arms Company), Springfield, Mass.

I claim, 1st, The metallic-block, b, and the recessed projection, E, upon the breech or loading end of the barrel or barrels, when constructed, arranged, and operating substantially as and for the purposes set forth,
2d, The described construction and arrangement, in reference to each other, of the block, b, and tumbler, f, whereby the hammers shall be raised to the half cock in the operation of releasing the breech from the frame, substantially as described.
3d, The projection, i, upon sear, h, in combination with the opening, i', in the plate, j', of the trigger, j, substantially as and for the purpose specified.

78,848.—SHACKLE JACK.—Jno. Whitlock, Birmingham, Conn.

I claim the combination of the hook frame, H H', with the slide, F, and the screw, G, or their equivalents, for the purposes above described.

78,849.—CATTLE TIE.—John Wiard, New Britain, Conn.

I claim, 1st, The socket, B. combined with the thumb screw, C, when the said thumb screw is provided with a head, having a perforation at one or both ends, so far to one side from the centre of the axis of the screw as that, when the tie is secured, the screw will be prevented from turning, substantially as herein set forth.
2d, The hook, G, formed upon the base, F, constructed with the lug, I, and seat, L, and provided with eye, E, or its equivalent, and combined with the snap, P, when the said snap is attached to its seat, I, and supported by the lug, I, substantially as herein set forth.

78,850.—BALL CASTER.—Lewis Wilkinson, Boston, Mass.

I claim a furniture caster having a ball, f, secured in a cup or socket a, by extensions, g, substantially as shown and described.
Also in combination with such socket, a, and extensions, g, the pins or projections e, against which the surface of the ball bears and rotates, substantially as shown and described.
Also in combination with the ball-containing cup or socket, the flanged plate or disk c, and screw spindle d, cast integral with the socket piece, substantially as described.

78,851.—CONSTRUCTION OF SAFES.—Francis H. Williams, Syracuse, N. Y.

I claim, 1st, So constructing and hinging the safe door A, and fitting it into the frame D, that this door shall be allowed to move bodily and squarely up to and from its seat without being rotated within the door casing, substantially as described.
2d, Fitting the door A to its frame D, by means of acute angular stepped faces h h' i i', substantially as described.
3d, Providing the double-leaf hinges b b, with a removable pintle c, when such hinges are applied upon the door of a safe or vault substantially as and for the purposes described.

78,852.—ANCHOR.—Frederick Wittram, San Francisco, Cal.

I claim an anchor having the shank A, with the openings B and C, and the two arms or flukes D and E, moving freely through the shank to either side, the whole constructed and operating substantially as and for the uses and purposes herein specified.

78,853.—STEAM ENGINE.—Devolson Wood and Stillman W. Robinson, Ann Arbor, Mich. Antedated March 31, 1868.

We claim the segmental pieces A A, to serve as a cylinder head, substantially as described.

REISSUES.

2,968.—PLATE FOR ARTIFICIAL TEETH.—Alfred B. Ely, trustee, Newton, Mass., assignee of L. R. Streeter. Patented Dec. 17, 1867.

I claim, 1st, The use of hard resins or resinous bodies, mixed with fibrous or textile materials, and shaped by means of heat and pressure, substantially as described.
2d, The use of thin plates of metal, horn, shell, gutta percha, wood, or such other suitable material, capable of being properly shaped, between or in combination with layers of the resinous and fibrous compounds, as and for the purposes substantially as described.
3d, As a base for artificial teeth or gums, etc., the use of fiber or fibrous material, chemically or mechanically treated or prepared, and saturated or mixed with lac or other suitable substances, which, when heated and pressed, or pressed and heated, will assume the proper shape, and possess or acquire the proper hardness and elasticity, substantially as described.

2,969.—HEEL STIFFENER.—Alfred B. Ely, Newton, Mass. Patented Dec. 31, 1867.

I claim, 1st, The use of resinous bodies combined with fibrous materials, substantially as described.
2d, A heel stiffener made of the above described substances, and formed into shape by means of pressure, with or without heat, substantially as described.
3d, A heel stiffener made of felted or woven fabric, saturated with resinous or other gums or analogous substances, which, when properly heated and pressed in molds, will assume the proper shape, and acquire or possess the proper hardness and elasticity, substantially as described.

2,970.—CHARGING WATER WITH CARBONIC ACID.—Robert Grant, Brooklyn, N. Y. Patented Jan. 28, 1868; antedated Jan. 17, 1868.

I claim, 1st, The charging of water or other liquid with carbonic acid gas, by the use, in combination, of two vessels, one containing the water or other liquid to be charged with carbonic acid gas, and the other containing carbonic acid gas, at a pressure greater than that of the atmosphere, the gas-holding vessel being separated from and not connected with the apparatus, by means of which the gas was generated or compressed.
2d, The combination with two vessels, one to contain water or other liquid, the other to contain gas at a high pressure, but disconnected from the gas generator, of pipes and coupling, and suitable stop cocks, for connecting and disconnecting the said vessels, as herein described, so that the gas holding vessel may be readily replaced by others at pleasure.
3d, In apparatus such as herein described and claimed in the preceding clause, the use of a gage for indicating the pressure in the water vessel of the liquid charged with gas, substantially as and for the purposes set forth.
4th, The combination with an independent gas holding vessel, of a water vessel provided or connected with a pump or other means of supplying the same with water or other liquid, substantially as herein described.
5th, The combination of the water and gas holding vessels, as herein described, with an injector, whereby the liquid from the water vessel may be more highly charged with gas from the gas holder, substantially as set forth.
6th, In combination with a gas holder, disconnected from the gas generator, a water vessel provided with means of agitating and thoroughly mixing the water and gas which it may contain, substantially as herein specified.
7th, In apparatus for charging water or other liquids with gas, as herein specified, the use of a regulator such as described, for the purpose of regulating the flow of gas and maintaining a uniform pressure in the mixing vessel, as shown and set forth.
8th, The combination with the gas holder of an injector, connected with a water reservoir as herein described, so that the water as it flows through the injector chamber shall be charged with gas, substantially as set forth.

2,971.—MANUFACTURE OF GLUE.—George Guenther, Chicago, Ill. Dated June 4, 1867.

I claim the mode of drying glue by revolving or rotating surfaces, having their temperatures raised either by steam or hot air, substantially as described.

2,972.—ARTICLE OF GLUE.—George Guenther, Chicago, Ill. Dated June 4, 1867.

I claim scale glue, produced as herein described, as a new article of manufacture.

2,973.—LAMP.—P. Hannay, Washington, D. C., and Hudson Taylor, Poughkeepsie, N. Y., assignees by mesne assignment of Pascal Plant, Washington, D. C. to Hudson Taylor, trustee. Dated April 6, 1858. Div. A.

I claim 1st, Causing a current of air to impinge upon or commingle with the lower or blue part of the flame of a hydrocarbon lamp, through the instrumentality of a cap piece or burner, without the aid of a chimney, substantially as described.
2d, A cap piece or burner combined with and applied to a hydrocarbon lamp, for the purpose of producing combustion without the aid of a chimney, substantially as described.
3d, Making the cap piece or burner adjustable relatively to the wick and wick tube, substantially as described.
4th, The combination of a flat wick tube with a cap piece or burner and arms or frames, whereby the burner is held on the wick tube, substantially as described.
5th, The combination of the burner, with devices for attaching and supporting the same, with the wick tube, substantially as described.

2,974.—LAMP.—P. Hannay, Washington, D. C., and Hudson Taylor, Poughkeepsie, N. Y., assignees by mesne assignments of Pascal Plant, Washington, D. C., assignors to Hudson Taylor, trustee. Dated April 6, 1858. Div. B.

I claim 1st, Combining a cap piece or burner, substantially as and for the purposes set forth, with the wick tube or top of a hydrocarbon lamp, so that the burner may be thrown back from the wick tube, substantially as and for the purposes described.
2d The combination of a hinged cap piece or burner with the means of adjusting the same relatively to the wick tube, substantially as described.
3d, A hinged burner or cap piece for a hydrocarbon lamp, when constructed and arranged with reference to the wick tube, wick or flame, and the admisson of air, substantially as described.

2,975.—STEAM BOILER FURNACE.—Henry McClure and Jas. Ellis, Terre Haute, Ind., assignees of Henry McClure. Dated Oct. 2, 1866.

We claim the arrangement of a series of steam boilers within a furnace, so that they shall lie transversely with respect to the direction of the draft, so that the products of combustion on their way to the chimney shall be directed against the sides and bottom of the boilers, substantially as described.
2d, Transversely arranged boilers in combination with an inverted arch flue, arranged beneath the boilers substantially as described.
3d, The ash troughs N, with end openings for the removal of ashes from an inverted arched flue which is beneath steam boilers, arranged substantially as described.
4th, Regulating plates O, when applied beneath the spaces between transversely arranged steam boilers, substantially as described.
5th, While not claiming broadly the introduction of air into furnaces for facilitating and rendering more complete combustion of inflammable gases we do claim air inlet pipes, a a, applied to the ridges of the arched flue beneath spaces left between boilers, which are arranged substantially as described.
6th, Transverse or cross ducts longitudinal draft passage and steam generators, substantially as and for the purpose set forth.

2,976.—DOOR AND GATE LATCH.—James A. Park, White House, N. J. Dated Feb. 12, 1867.

I claim the annular latch C, constructed substantially as described, secured upon a suitable rock shaft B, and operated in one direction either by means of a weighted handle upon said shaft, or by means of a spring, as and for the purpose herein specified.

2,977.—FRUIT JAR.—S. B. Rowley, Philadelphia, Pa., assignee by mesne assignments of Thomas G. Otterson Millville, N. J. Dated Nov. 4, 1862.

I claim the within described recess, formed on the exterior of the jar beneath the mouth of the same, the bottom of the recess forming a continuation of the shoulder on the neck of the jar, all substantially as and for the purpose herein set forth.

2,978.—STEAM DRYING APPARATUS.—Wm. Ryner, Philadelphia, Pa., and John C. Hopewell, Flemington, N. J., assignees of Wm. Ryner, Philadelphia, Pa. Dated Aug. 27, 1867.

We claim a drying kiln in which are an upper and lower series of pipes, for the passage of superheated steam to, and the introduction of the same into, the kiln, so that the material to be dried (situated between the two sets of pipes) may be subjected to the combined action of the heat from the said pipes, and that of the superheated steam, as set forth.

2,979 —PULVERULENT ACID FOR USE IN THE PREPARATION OF SODA POWDERS, FARINACEOUS FOOD, AND FOR OTHER PURPOSES.—The Rumford Chemical Works, Providence, R. I., assignees by mesne assignments of Eben Norton Horsford. Dated April 22, 1856.

I claim 1st, As a new manufacture, the above described pulverulent phosphoric acid.
2d, The manufacture of the above described pulverulent phosphoric acid, so that it may be applied in the manner and for the purposes above described.
3d, The mixing in the preparation of farinaceous food, with flour, of a powder or powders, such as described, consisting of ingredients which phosphoric acid or acid phosphates and alkaline carbonates are the active agents for the purpose of liberating carbonic acid, as described, when subjected to moisture or heat, or both.
4th, The use of phosphoric acid or acid phosphates, when employed with alkaline carbonates, as a substitute for ferment or leaven in the preparation of farinaceous food.

2,980.—GRATE BAR.—Samuel Vansyckel, Titusville, Pa. Dated October 31, 1864.

I claim constructing grate bars with pins or projections on one of the sides of the bar and with corresponding mortises or recesses in the other side whereby the bars can be interlocked and held together and made self-sustaining throughout their entire length substantially as described and specified.

2,981.—VESSEL FOR HOLDING LIQUIDS.—Julia M. Colburn, Baltimore, Md., administratrix of the estate of James Stimpson, deceased. Dated October 17, 1854. Antedated April 17 1854. Extended seven years.

I claim 1st, A pitcher for preserving ice water cool combined with double walls inclosing between them air or equivalent non-conducting material so arranged as not to impair the portability of the pitcher and its capability of discharging its contents by pouring, nor its capacity for holding water.
2d, In combination with a double wall ice pitcher a nose, lip, or spout, through which the water is discharged, and a movable cover across the discharge way which prevents access of air into the pitcher thereat except during the act of pouring.

2,982.—HARVESTER RAKE.—Owen Dorsey, Newark, Ohio. Dated March 4, 1856. Reissue 1,067. Dated October 23 1860.

I claim 1st, A continuously-revolving rake attached by a pivotal connection to the shaft on which it revolves so as to allow it to describe the proper path to gather or discharge the grain and to clear the frame.
2d, The combination of a platform, a vibrating cutter, and a continuously-revolving gathering and discharging rake so arranged as to enter the uncut grain in front of the cutter and to discharge the cut grain in the arc of a circle.
3d, A continuously-revolving gathering and discharging rake which enters the uncut grain in front of the cutters and discharges the cut grain in the arc of a circle in combination with one or more intermediate revolving gathering heads or beaters.
4th, The combination of a continuously-revolving gathering and discharging rake which discharges the grain in the arc of a circle and the cam way or guide for regulating the course of the rake.
5th, The combination of a continuously revolving rake which discharges the grain in the arc of a circle with a platform having a fender conformed substantially to the path described by the outer end of the revolving rake in passing over the same, substantially as described.
6th The combination of a continuously-revolving gathering and discharging rake which discharges the grain in the arc of a circle with a vibrating cutter
7th, The combination of a continously-revolving gathering and discharging rake, a cam way or guide, and friction rollers attached to the arms of said revolving rake.

2,983.—OBTAINING CANE FIBER FROM CANE.—Sydney C. Long and F. Schumacher, Baltimore, Md., and Jackson Warner, Cincinnati, Ohio, assignees by mesne assignments of B. A. Lavender and Kate Lowe, administratrix of estate of H. Lowe, deceased. Dated April 4, 1851. Extended seven years. Reissued June 9, 1868.

We claim 1st, Obtaining the fiber from the cane or reed (*Arundinaria Macrosperma of Michaux*), for the purpose specified.
2d, Cane cotton or hemp, as a new article of commerce and manufacture, for the purpose specified.
3d Breaking down woody fiber of cane and other like plants and dissolving the gummy and other foreign matters therefrom by means of muriatic or sulphuric acid of the strength of 10° Baume or thereabout preparatory to making hemp or cotton for bagging, rope, paper pulp, etc., in the manner substantially as set forth.

KING'S PATENT SOLID STEAM PACKING RING.

It is a well-known fact among mechanics that a properly-fitted solid piston without rings, especially when supported in place by a piston rod running through glands on each end of the cylinder, will keep tight for a long time and do good work. Such a piston has less friction than those which are held to place by springs, and while it fits, works very smoothly, but when worn must be replaced by a new one or turned down and reenforced. The rings of ordinary pistons, although turned very true, are apt to spring and warp when cut, and are difficult to keep true. To overcome these objections is the intention of the inventor of the piston packing herewith illustrated. It requires but one set of rings, and their inner surfaces need not be turned, as they fit neither inner rings nor the periphery of the spider; thus much time, labor, and expense are saved in fitting up the piston.

A is the piston rod, and B the spider. C represents a section of the steam cylinder, and D the packing rings. These rings are whole and two or more are used, although for

Fig. 1

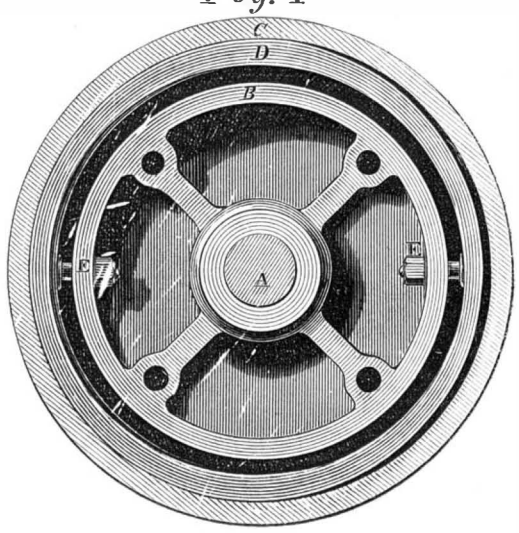
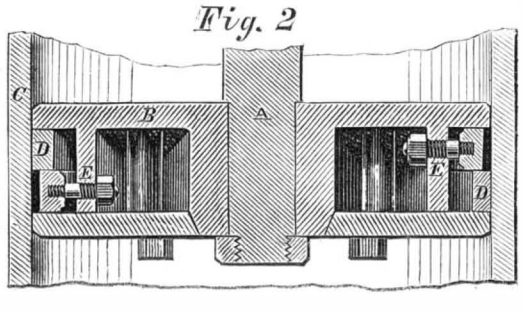


Fig. 2



most cases two are sufficient. A portion of each ring forms a spring, a bolt, E, on the opposite side passing through the periphery of the spider and engaging with the ring. This, as seen in the engravings, forces the ring for one half or two thirds its circumference against the internal surface of the cylinder, and as the two rings—if only two are used—are compressed on opposite sides, the result is a perfectly steam-tight joint. It may be advisable to make that part of the ring which receives the screw bolt, or its equivalent, thinner than that portion which bears against the cylinder; the thinner parts will thus be more elastic while the thicker or bearing parts will be more rigid and less liable to wear the bore of the cylinder oval. It appears to us that this piston has real advantages over the common split ring piston, and would prove economical not only in first cost, but in use, particularly for cylinders of moderate diameter. Its cost, the inventor says, is only five eighths of that of common ring piston packings, and one third of those having two sets of rings, saving sixty-six per cent of friction.

Patented through the Scientific American Patent Agency March 24, 1868. Shop, county, and State rights for sale for less than the difference of cost between it and steam or spring packing. Address H. J. King, 47 Hudson street, Hoboken, N. J.

The English Iron Trade.

AT the present moment the iron trade of England is very much depressed, owing, it is said, to the fact, that the co-operative trade movement has disorganized the labor.

The consequence has been to transfer the trade to Rhenish Prussia and Belgium. The works at Essen produce 60,000 tuns of steel annually, which is more than twice the entire export of the United Kingdom; and the Terre Noire Company in France are now supplying one of the great French railway companies with 20,000 tons of steel rails at a price below their prime cost in England, in spite of comparatively dear fuel and ores. These are awkward facts to be well pondered both by masters and men, if haply, for their own sakes, they can find a remedy for their disagreements.

Cast and Sheet Iron Stoves.

A FRENCH philosopher holds the opinion that cast iron stoves cause headache, nausea, and dryness of skin; while stoves made of sheet iron produce none of these effects, and, on the contrary, excite perspiration, and encourage appetite. He thinks it possible that the persistent disease of the silk worm in France, may be traced to the use of cast iron stoves in hatching and rearing the insect.

We have no means of verifying the above theory, but we well remember that, when the sheet iron air tight stove was first introduced "to save one-half the fuel," a statement was also put forth, that they were more healthy than cast iron.

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Improvement in Machines for Developing Gas from Hydrocarbons.

The manufacture of illuminating gas by carbureting the atmosphere with liquid hydrocarbons, has long been known and used, but its general introduction was greatly retarded by the cost of the hydrocarbon liquid before the discovery of petroleum in this country, and the absolute inefficiency of the different kinds of apparatus used to make the gas. A great many patents have been taken out to make gas from the volatile portions of crude petroleum, but they have been defective by reason of their being automatic, that is, they manufacture gas only as fast as used; therefore a constant evaporation is taking place while the gas is burning. The objections to this class of machines are these: In proportion to the rapidity of the evaporation of the liquid is the reduction of temperature or loss of heat; now, as the quantity of hydrocarbon vapor which will unite with the atmosphere depends upon the temperature of the liquid and atmosphere, it of course follows that unless a uniform temperature is preserved gas of a uniform quality will not be produced. In order to obviate this difficulty of refrigeration, heat has been applied in many ways to keep up the temperature. Now if a little too great heat is produced the atmosphere will become supersaturated with the vapor, and, most certainly, condensation of the vapor into a liquid will follow. The danger of such a condition need not be dwelt upon; every pendant and chandelier becomes filled with liquid gasoline, and, of course, as soon as the gas stops are opened the gasoline would be ignited by the match applied to light the gas. By Rand's process these dangers and difficulties are overcome by the utilization of the earth heat.

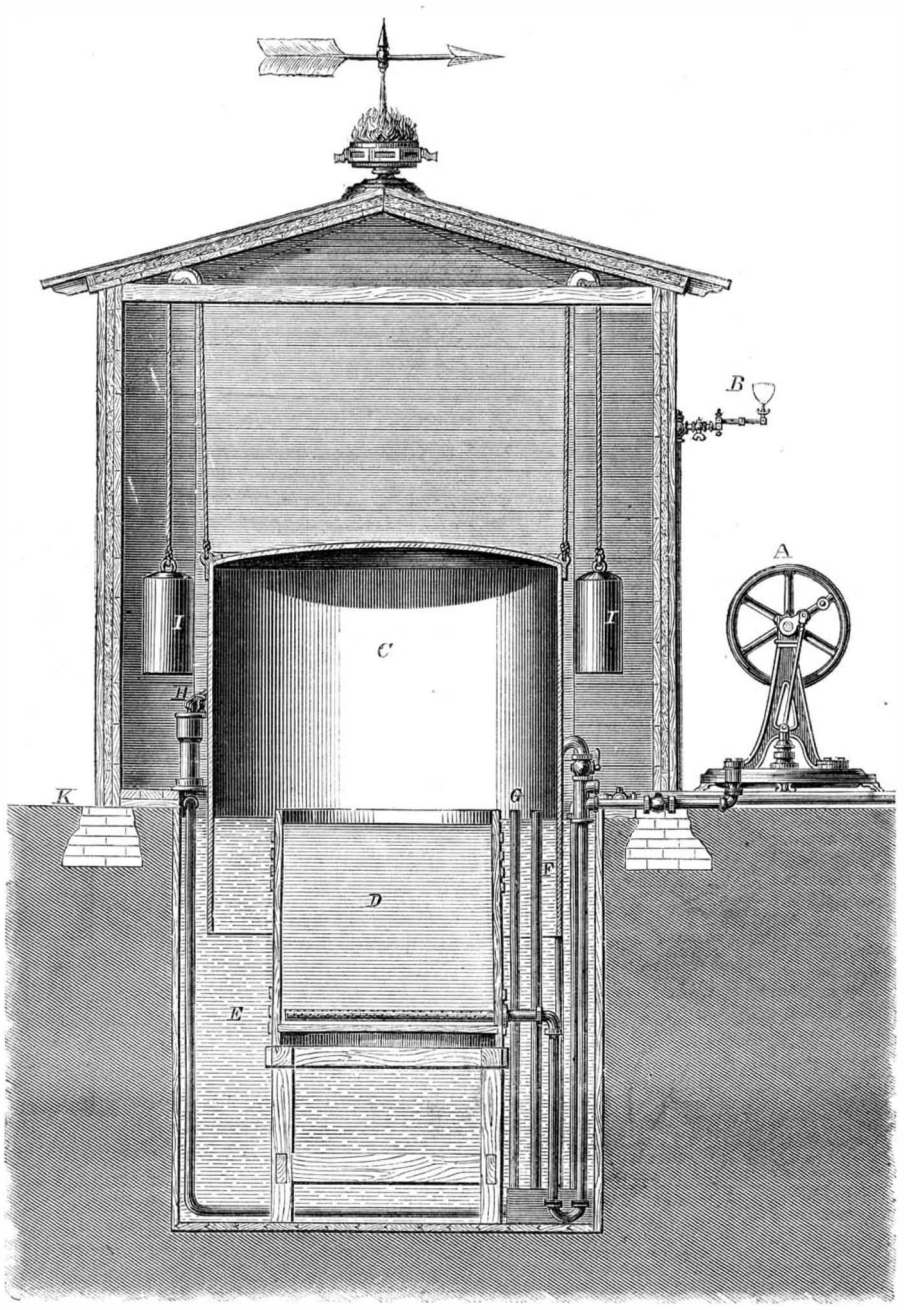
The *modus operandi* is simply this. A cistern is placed in the ground, and inside of this cistern is firmly secured a small tank, D, to hold the liquid from which the gas is made. Outside of this tank is the water bath, E, so it will be observed the sides and bottom of the hydrocarbon tank are covered by water. The air pump, A, supplies the air to the bottom of the tank, D, from which it issues in fine streams from a perforated horizontal pipe into the gasoline, up through which it passes into the holder, C; there it remains during the day and is drawn off through the usual exit pipe, G, into the pipes leading to the burners. If by reason of the very light specific gravity of the gasoline the gas should smoke, the diluting pipe, F, with the air pump, is so arranged that the air is driven at once into the holder without entering the gasoline tank. By the use of this pipe the gas can be made of any quality desirable. The objects of placing the tank in the ground are, first, its safety from accidents by fire; next, the uniformly low temperature maintained in the gasoline storage tank, and lastly, the heat known as sensible heat of the water, and latent heat in the earth, are utilized in this manner. As the gas for a large house is made by these works in five minutes, the evaporation of course is very rapid and the loss of heat consequently great. Now as soon as the temperature of the gasoline becomes lowered by evaporation, the heat from the water and earth acts upon the fluid, and before the next batch is to be made the gasoline has absorbed enough heat from the earth to bring its temperature up to the point where it was before evaporation commenced.

The tank, D, is always made of sufficient capacity to hold liquid enough for at least one year; thus the danger of filling often is avoided. This gas is practically incondensable, the gas having its birth at a low temperature, will not condense in the pipes leading to the burners. If it was possible at such a low temperature to surcharge the air with hydrocarbon vapor, the gas standing a number of hours over water would part with its excess of heat and precipitate the excess.

In the engraving, B represents a gas burner, placed in this instance in close contiguity with the works, but which may be at any required distance from the tank. H is a drip pump; I, the balancing weights, and K, the surface of the ground. The apparatus may be placed at any distance required from the point where the gas is used, and it may be covered by an ornamental structure, as seen in the engraving.

This method of utilizing liquid hydrocarbons is the subject of two patents, bearing date, Feb. 26 and Dec. 25, 1867. It has received the commendation of many competent judges, including persons who are using the apparatus, and has been adopted by the Metropolitan Gas Company of New York, who submitted the plan during the past winter to the severest tests of low temperature of the atmosphere, with such success that the company has purchased the right for their lines.

The New York office for these patents is at 16 Nassau street, where working models are on exhibition. Address A. C. Rand & Co., as above, for further information.



RAND'S PNEUMATIC GAS GENERATOR.

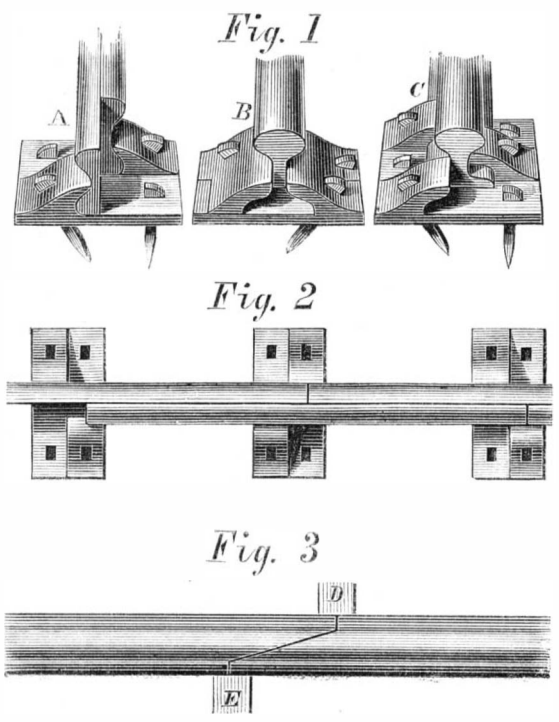
Transfer Composition.

Patented by Max Rosenthal, of Philadelphia, Pa :—

I use the cheapest kind of unsized paper; I use one pound of fine starch; half an ounce of common washing soap; one ounce of rock candy, dissolved in water, and about twenty drops of glycerin. Mix the ingredients warm, and let the mixture stand until cold. I then apply this mixture to the paper with a brush, coating the paper on one side only, and leave it to dry. After it has thoroughly dried, I apply on the top of the dried surface another mixture, composed of gum-arabic and rock candy, one ounce of each, dissolved in a pint of water, and coat the same prepared surface again with a clean brush, and let it dry, when the paper is ready for use, and the prepared side of the paper to be printed upon by the usual mode of printing. After the printing is done, the printed side is instantly transferred upon any smooth surface of any material, by merely moistening the back of the paper with clean water, and the paper can be instantly removed by raising it up, and the impression is thus easily, quickly, and permanently transferred.

DOWNING'S PATENT IMPROVED RAILWAY CHAIR.

Double rails, made in two pieces as though divided vertically, have been used, but the two sections were secured, to make a whole rail, by means of rivets or bolts, which were seated in place as the rails were laid. This made a smooth roadway, breaking joints, but the strain on the connecting bolts or rivets proved to be too great, and the halves of the rails tended to separate by the breaking of the connecting bolts. By the adoption of an improved chair, having only a single head, as at A, Fig. 1, the ends of these compound rails are intended by the inventor to be firmly held. These double rails may be turned to present one face when another is too much worn. The spike on the low side of the chair is driven, as usual, vertically, the rail put to place, and then the spike on the side of the chair head driven at an angle, as seen firmly locking the rail. This peculiar action of the angularly driven spikes with the double or single-headed chairs, is seen at B and C, Fig. 1. A top view of a double rail with single chairs is seen in Fig. 2. The third figure presents a a modification of the ordinary solid rail, only having a scarf joint, secured at D and E, by the single-headed chairs. By the use of this chair, with the angularly driven holding spike, all wedges are dispensed with, and the rails, either at their joints or at any other point, firmly held. The chair seen at B, Fig. 1, is considered by the inventor as well adapted to the present style of rails with butt joints, as two will take the place of three single ones. The saving in amount of spikes—as only one is used with this chair where two are used with the ordinary chair—and the dispensing with wedges, apt to work loose, would seem to recommend this device to the attention of railroad men. It was patented by John H. Downing, Dec. 10, 1867, who may be addressed relative thereto at Salem, Mass.



Silk Manufactures of Lyons.

France possesses within her own bounds three out of the four fibrous substances from which clothing is made—she has flax, wool, silk. The latter, which employs so many people at Lyons, is grown further south. The silk is separated from the cocoons, and is spun in other districts. The trade of Lyons consists of weaving cloth from the thread which is brought into the town. The silk grown in France is not sufficient to supply the demand, and she imports raw silk from Italy. The culture of silk receives considerable attention in France, where the Government seems to act upon the idea expressed in the China laws, which point out two classes as deserving the gratitude of all—the grower of corn and the grower of silk, the former supplying food, the latter clothing. Lyons has none of the peculiarities which we usually connect with a manufacturing town. There are no tall chimneys, no dingy warehouses, no immense factories, no smoke. The looms are light, and are erected in the houses of the people. They are worked by hand. Thus you do not see at certain hours busy masses of people flowing to and from the same spot. The work goes on quietly. A good deal of it is, as the silks are narrow and the throw of the shuttle short, done by women.

The price paid for weaving plain silks is about fourteen cents per yard; for rich and flowered silks it is more. This trade suffered much from the American war, which greatly lessened the demand, and the people are not now working more than half time. The silk manufacture of France originated in the luxury of the Court of Francis I. In addition to that grown in France, the imports of raw silk were, in 1792, 136,000 lbs. The manufacture had increased so much that the quantity imported in 1851 had increased to 2,291,500 lbs., or about seventeen fold. Lyons has on several occasions been the scene of trade outbreaks, in consequence of attempts to introduce machinery or to alter the rate of wages. The cost of carrying coal will always operate in favor of manual labor. Great Britain offers a large and increasing market. She used to import raw silk and manufacture it in England, but the importation of raw silk has decreased, and silk manufacturing has lessened. The imports of raw silk have lessened to one half, of silks from India to one fourth, while the import of silks from Europe has increased nearly tenfold, and that of ribbons has doubled. The Lyonese silk weavers comprise about 120,000, out of a population of 300,000.

Estimation of the Quality of Soap.

The quality of soap may be properly estimated from the amount of fatty acids which any given specimen contains. The following simple analysis may be performed by any one, and may be relied upon as giving good results.

The soap to be examined should be dissolved in water. If distilled water cannot be readily obtained, rain water will answer well enough. When a perfect solution is obtained, add hydrochloric acid. After a little while the fatty acids will be found to be separated from the other constituents of the soap. These should be collected, and their relative weight for any given quantity estimated. The relative weight thus found will be a sufficiently just indication of the quality.

THE *Amelia* steamboat, at San Francisco, Cal., is being fitted to burn petroleum. Anthracite coal being worth $20 a tun, and oil $5 a barrel, it is expected that the liquid fuel will prove exceedingly economical. In back number of the SCIENTIFIC AMERICAN we have given the comparative fuel values of oils and anthracite, to which those interested in the subject may readily refer.

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VOL. XVIII., No. 26....[NEW SERIES.].. *Twenty-third Year.*

NEW YORK, SATURDAY, JUNE 27, 1868.

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END OF VOL. XVIII.---BEGINNING OF A NEW VOLUME

The present issue of the SCIENTIFIC AMERICAN completes Volume XVIII., new series. Probably there never was a time when greater activity was displayed in the sciences and arts than the present. And this activity is not confined to this country, but our foreign exchanges afford us, weekly, many items of interest to the scientist, mechanic, and farmer. From these sources we glean everything which can interest our readers, in whatever walk of life, and every important improvement in mechanics or discovery in science, which is made in this country, receives an early and prominent recognition. Thus the SCIENTIFIC AMERICAN is literally a compendium of all that is new and valuable in the arts and sciences.

In other departments we believe it to be equally valuable. Its pages contain correspondence from all parts of the country and the world, on subjects which cannot fail to interest all classes. They are frequently the productions of our most eminent scholars and engineers, while the hints, suggestions, and directions of our working mechanics find place in our columns. These are always interesting, and not seldom exceedingly valuable.

The answers to correspondents are always instructive. We endeavor in framing them not only to convey the information sought by the individual inquirer, but to instruct others. In fact, this department is intended to give such items of information succinctly as do not require a column of editorial. The contributors to this department are men who are practically conversant with the subjects upon which they profess to treat.

Our descriptions, accompanied with illustrations, give our readers accurate information of the latest and most important inventions. The engravings are not equaled by those published in any other country, and the descriptions, for terseness, clearness, and conciseness, are certainly not surpassed.

Our weekly list of patent claims are received direct from the Patent Office in Washington. They are full, accurate, and alphabetically arranged for convenience of reference. They are invaluable to the mechanic, inventor, and capitalist.

Editorially, we believe the SCIENTIFIC AMERICAN will compare favorably with any journal devoted to similar objects. The writers are gentlemen of long experience and undoubted ability, and they aim rather at presenting facts and practical suggestions than mere conjectures and speculative theories.

That we have succeeded in making a popular scientific and mechanical journal, our constantly increasing list of subscribers fully demonstrates. What the paper has been in the past it will be in the future; encouraging the struggling inventor, instructing the unlearned mechanic, informing the scientific student, interesting the young and the old. It will fearlessly expose unwarranted pretension, and rebuke charlatanism, while it faithfully records the improvements made by inventors and mechanics.

THE INDICATOR AS A FIXTURE TO THE STEAM ENGINE.

The steam engine indicator has received occasional notices in our columns, in which its construction and operation have been described and its uses partially enumerated. We have shown that it gives exact information of the working of the valves, the admission, expansion, and pressure of the steam, its action at all parts of the stroke, transferring these points to paper and forming a diagram which is a basis of the calculations to ascertain the force expended and the power exerted.

But there are other offices and uses of the indicator. By it the relative value of the lubricants used can be ascertained and the best mode of applying them; the amount of steam required to work the attached machinery as compared with the work done, consequently the saving that can be made in changing machinery to do the same work. Another important office of the indicator is to compare the power developed with the amount of fuel used. This is a check upon the carelessness of the fireman or of the engineer; for if it is known that an engine can be run with an expenditure of two and a half or three pounds of coal per hour for each horse power on one day, there can exist no reason, except carelessness or heedlessness, why, other things being equal, it should not do the same on another day. It also determines the quality of the fuel. Suppose the last invoice of coal gave one horse power for every two and a half pounds consumed per hour. On one day four thousand pounds are used, but on another day, four thousand five hundred pounds. The indicator shows on both days the same amount of power exerted and that the engine is in the same condition. Then the question is narrowed down to the neglect or carelessness of engineer or fireman, or to a difference in the quality of the coal. If, on weighing the ashes and clinkers it be seen that on one day they exceeded in amount those made on the other day, it would be plain that the difference in results arose from difference in the quality of the fuel. The incombustible portion of anthracite coal varies from six per cent to thirty per cent. The proof of its quality can be determined in no way so well as by the indicator combined with the scales.

Every engine—all large engines—should have a pair of indicators permanently attached, and an engineer should be employed who can intelligently use them. A pair of diagrams should be taken twice a day, say at 9 P. M. and 3 P. M. Let every pound of coal be weighed and also the ashes and clinkers, and a tabular statement of these facts and the results of the indicator diagrams be made out daily on blanks furnished for the purpose, and a balance struck each week. Thus the proprietor will know at a glance the condition of his engine, the efficiency of his machinery, and the value of his fuel—in fact the cost of all his expenditure of power as compared with the work done.

This may be objected to on the ground that few engineers can be found who can use the indicator, and that some firemen cannot read the scale of the weighing machine. The objection refutes itself; if men are not competent to perform these duties they are not competent engineers or firemen. The use of the indicator can be acquired by the study of such elementary books as "Porter on the Indicator," "Paul Stillman's Treatise," "King's Notes on Engineering," "Bourne's Handbook," etc. By the aid of these and practice with the implement any intelligent engineer can readily become an adept in the use of the indicator.

Such education will tend to raise the status of mechanical engineers, reduce the cost of power, insure better work, and induce superior mechanics to adopt practical engineering as a vocation.

CAPITAL AND LABOR AS AFFECTED BY LABOR-SAVING MACHINERY.

It was thought in former times that the introduction of labor-saving machinery into any department of manufacture, would be the means of throwing large numbers of operatives out of employment, yet the result has shown those fears to be unfounded. The introduction of any improvement that enables individual productions to be made with less manual labor, and at a consequently reduced cost, has always made an increased demand for labor in that department. *Labor creating machines* would be a more significant term, so far as the effect of such inventions upon the amount of production is involved.

To illustrate this idea, let us suppose a machine to be invented that would enable an operative to make two hats while he now can make one. Let us further suppose the cost of producing hats by manual labor only, to be $3 00 apiece, one half the cost being for labor and the other being for the materials of which each is made. Allow a profit of one dollar, which will make the price of the hat to the purchaser $4 00, so long as manual labor alone is used. Upon the introduction of the machinery, which doubles the amount of production, the cost for labor would be reduced one half. The profit for a single hat, estimated at the same rate of percentage, would be less than a hat costing $3 00, so that the price of hats would thus be reduced, say one third. Further, suppose the reduction in price to increase the demand for hats, so that three hats would be wanted where one was desired previous to the improvement in their manufacture. It will now be apparent that the introduction of machinery, while it has reduced the manual labor connected with the production of a single hat one half, has increased by one half the amount of labor needed for the entire production of hats.

How has the relation which capital bears to labor been affected by the constantly increasing use of machinery in all branches of manufacture? Manifestly they have been brought nearer together, until now it is somewhat difficult to determine which has the balance of power. Operatives complain of insufficient remuneration, and are continually embarrassing large manufacturing interests by combinations and strikes. On the other hand, capitalists complain that, in view of all the risks and complications attendant upon fluctuations of trade and unreasonable demands of employés, that capital cannot be embarked in any manufacturing enterprise with a certainty that it will return the legal interest upon the amount invested.

These complaints, though in some measure sustained by facts upon both sides, are essentially without a solid foundation. Capital and labor are interdependent, and are only rendered antagonistic when either disregards the just claims of the other. Both suffer from the withdrawal of either; but when they mutually and harmoniously coöperate, all classes prosper.

We cannot admit, however, that of late capital has obtained any undue advantage over labor. That money has been made in certain branches of manufacture cannot be denied; but if we deny the right of capital to accumulate by legitimate use, we strike a blow at the very root of sound social organization. But where any remarkable instance of profit by manufacture, within the last ten years, can be pointed out, it will doubtless be found that the question of capital is involved with other elements, which should not be allowed to escape observation. If, for instance, an individual with limited means is enabled to commence the manufacture of a patented article, and, by virtue of the intrinsic value of the invention, can obtain a very large advance on cost of production, sufficient to allow him to realize a fortune in a short time, it is not the capital involved, nor the labor, considered singly or together, that are the cause of profit; it is the brain which devised, and the skill which developed the means for the acquisition of wealth. For employés to demand, in such a case, an increase of wages, on the ground that the employer is making money so fast, is equivalent to demanding of him a share of the privileges which are granted to him by letters patent, in addition to the market value of labor, at the time the demand is made. Notwithstanding the evident truth of this proposition, such demands are often made. In fact, the sole cause of discontent among operatives at the present time, is the desire to enjoy the luxuries and privileges, which in former years were only the accessories of wealth. It is not the gratification which such things are capable of imparting of themselves alone, which is sought, but the avoidance of the unhappiness generated by the lack of them.

We intend in a future number to show that the effect of the introduction of labor-saving machinery has been to constantly increase wages, and to prevent any permanent reduction, and that, from the nature of the case, such must be its effect in the future. If we establish this proposition, it will follow that the whole machinery of "Trades Unions," and combinations of a similar character, are only attempting to secure that which is inevitable, and to prevent that which can never come to pass.

THE LATEST NOVELTY IN PHOTOGRAPHY.

Perhaps the most curious invention of the present day is the new kind of photographs, made on a so-called phosphorescent surface, of which absolutely nothing can be seen in the daylight, but which is distinctly visible in the dark. Many years ago, compounds were invented which had the property of shining in the dark many hours, and even days or weeks, after an exposure to sunlight for only a few seconds. These phosphoric compounds, called after their inventors Canton's, Baldwin's, Bolognian phosphorus, etc., were formerly of no use whatever, but it was hoped that they might eventually reveal something concerning the nature of light; and such has indeed been the case, as the phenomena connected with these experiments are a strong argument in favor of the undulatory theory, and the correlation of forces.

An English photographer lately conceived the idea of covering a sheet of paper or glass with a layer of such a phosphorescent substance, and then treating it in a similar manner to paper or glass sensitized in the ordinary way for taking a photograph. Pictures taken in this way seem, by daylight, to have no existence, but the places where the light has acted upon, become phosphorescent or luminous in the dark, the shadows remaining invisible, the semi-tints slightly luminous, and the result is such a change in the surface that the picture is only perceptible in a dark room, by an unearthly glow of a greenish, blue, red, or purplish tint, according to the preparation used.

We notice this invention only by reason of its oddity, and not for its utility. The only practical use we see for it, would be to terrify the uninitiated by the exhibition of luminous images of skulls, skeletons, demons, and similarly cheerful subjects suddenly appearing on the walls, window panes, curtains, or other unexpected localities at the moment the lights are extinguished. It is very easy to make such pictures. A sheet of albumen paper is moistened to make it sticky, and then equally covered with a thin layer of the finely powdered phosphorescent substance, or a pane of glass is covered with a thin coating of paraffine, to which also, when warmed, the powder will stick; then the prepared surface is treated as in taking an ordinary photograph, either by placing it in the camera, or exposing it for a few seconds under a positive to the rays of the sun, or the magnesium or electric light.

The only thing remaining to state is the preparation of these phosphorescent substances. One of the cheapest is Canton's phosphorus, and it is made by burning oyster shells for half an hour, powdering and mixing with an equal weight of sulphur, and heating again for one hour in a covered crucible. The produced substance must of course be preserved in the dark, and protected from moisture in a well closed bottle. Wach found that the luminosity is much increased by moistening the mixture of shells and sulphur before the second heating, with a solution of sulphide of arsenic in liquid ammonia. The powder thus obtained emits so strong a light of blue color that it does not require perfect darkness to perceive its glow.

Baldwin's phosphorus, mentioned above, is prepared by dissolving chalk in nitric acid, then heating and grinding it to powder. The Bolognian phosphorus is made by simply heating a mixture of powdered heavy spar with the white of eggs, gum water, or a solution of tragacanth. Fluor spar is naturally such a phosphorescent substance, some specimens however more than others, and diamond appears to be the best; but the expense of the powder would hardly admit of its employment for the above mentioned purpose. Experiments have proved this property, in some degree, to exist in a great number of substances not suspected to possess such a singular quality; for instance, many natural compounds of lime, baryta, strontia, and magnesia; besides corals, fossil bones, and teeth; the shells of eggs, oriental

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pearls, dry bleached linen, white paper, and even the stones extracted from the human bladder.

Grott has found that the same luminous rays—the blue and violet—which produce the photographic pictures, also produce this effect, and that the rays which have no photographic powers—red and orange—not only do not produce it, but extinguish the existing luminosity. However, this is not because it is easily extinguished, as handling and even immersion in water will have no effect upon it, neither plunging the body in different gases. Groszer found that the luminosity was not even in the least impaired in a perfect vacuum.

Some philosophers have already, and with apparent good grounds, mentioned their suspicion that in nature the same phosphoresence may take place on a larger scale, that we see in different minerals, fossils, and preparations on a small scale, and if so, planets and comets are luminous partly by light reflected from the sun, and partly by phosphoresence of their own. That comets possess such a light of their own has been proved by Arago's conclusive observations by means of polarized light; and perhaps the peculiar appearance of the moon during its eclipse is due, besides the refraction and absorption of light in our atmosphere, to such a phosphoresence; even ice shows luminosity in the dark for several hours, when suddenly withdrawn from sunlight exposure to a dark room. The periodical obscuration taking place during the moon's phases is so slow that no phosphoresence can show itself, but on the occasion of an eclipse the obscuration is so rapid that any phosphoresence on its surface persisting for an hour or half an hour must become visible.

Practical Researches in Sugar Refining.

M. Monnier, of France, has recently published his researches in sugar refining from which we publish some interesting facts:

If sulphurous acid gas is conducted into a chamber containing coarse sugar, the latter is promptly bleached, and about three-fourths of the coloring matter is entirely destroyed, while the sugar undergoes no change whatever in composition. After this treatment the sugar smells strongly of sulphurous acid, which presents no inconvenience in the process of refining. To bleach sugar in this manner; for 1000 parts by weight of sugar about four parts of sulphur must be burnt and the gas conducted into the chamber. When the operation is once set going, the proportion of sulphur may be notably diminished. The sulphur is converted into gas by combustion in a little furnace placed at the side of the chamber. When the action is complete, the sugar is dissolved in water and its sulphurous acid neutralized by a small quantity of lime. This lime may be previously converted into sucrate of lime by M. Peligot's method, that is, by crushing it with a little sirup; for 1000 pounds of sugar three or four pounds of lime are requisite to obtain this sucrate.

M. Monnier has been at great trouble to ascertain whether the sulphurous acid gas thus used modified the sugar so as to produce a certain amount of grape or non-crystallizable sugar, and he has convinced himself that sugar bleached in this manner undergoes no change whatever. The quantity of non-crystallizable sugar, found by analysis after the operation in question, was in each case exactly equal to the amount which the sugar contained before being bleached; namely, on the average, about 2·15 per cent. In all these experiments the sugar was exposed about forty-eight hours to the bleaching action.

The above process gives most striking results with exotic sugars, which are highly colored; with lighter-colored samples, the bleaching is not so marked, but in the former case, two thirds to three-fourths of the heterogeneous coloring matters are eliminated completely.

The author took the same opportunity of examining into the action of chlorine gas, and precisely in the same manner. But the result was very different. In destroying the coloring matters present in the sugar, chlorine is converted into hydrochloric acid, which at once renders a certain amount of sugar non-crystallizable even at the ordinary temperatures. A specimen was taken for experiment which contained two per cent of non-crystallizable sugar; it was submitted to the action of chlorine for twenty-four hours only, and then a fair specimen of the whole bulk was taken and analysed. It showed no less than nineteen per cent of uncrystallizable sugar. If it were not for this enormous loss, the action of chlorine as a bleaching agent would be preferable to that of sulphurous acid, for its action is more rapid and complete; but it does not appear possible to prevent its destructive action upon the sugar itself.

It was lately hinted in London that ozone was going to be used as a bleaching agent in sugar refining, and we believe one or more patents were taken out for this purpose. We should be glad to learn whether anything really practical has been done in that direction, and whether ozone will prove to be a more economical agent, or more complete in its action, than sulphurous acid gas, used as indicated above.

New Grain Warehouses of Liverpool.

The city of Liverpool is justly celebrated for its magnificent docks, which extend a distance of seven miles along the river Mersey. With a view to the proper handling and storage of the immense shipments of grain, the Harbor Board at Liverpool and Birkenhead have constructed some new warehouses, which we recently visited, the most perfect buildings of the kind in the world. On the Liverpool side the new warehouses, which are fire-proof, comprise three blocks, forming a quadrangle, within the margin of which is the dock. The total length of the building is 1,485 feet by 70 feet in width. Beside the quay floor there are five stories available for storage, and a sixth, which is appropriated as a machinery floor.

The aggregate clear internal area, including the quay floor, is 11¾ acres. The hight of the building from the quay to the top of the cornice is 82 feet. The stores, with the exception of the quay floor, which is 15 feet 3 inches high, are 9 feet three inches from the surface to the underside of girder above. Every attention has been paid to the relative strength of each part of the structure, the breaking strain of the beams and girders being three times the load they are intended to carry. An idea of the vast capacity of the warehouses may be gained from the fact that the total weight of grain upon the floors when fully loaded will amount to not less than 77,660 tuns. The clear aggregate storage area of all the floors, exclusive of the quay and silo spaces, is 48,918 square yards, affording storage capacity for 196,000 quarters of grain. A quarter is equal to 8 bushels. Rails are laid within the warehouses, forming a communication with the main dock line.

Throughout the building the machinery for hoisting and distributing the grain is worked by hydraulic power. There are five self-acting, traversing, rocking cranes, for raising the grain in tubs from the hold of the ship. Each crane is capable of raising a tun of grain at a time at the rate of 50 tuns per hour, through an extreme distance of 136 feet. Having brought the grain to the machinery floor at the top of the warehouses, the cranes discharge it into hoppers, from which, after being freed from dust, it is weighed by a single operation in one tun lots, and then transmitted by a most ingenious arrangement to any part of the warehouses. This work of transmission is effected by means of endless bands, of which there are two running the entire length of the three stacks of warehouses. The bands are of vulcanized india-rubber, 18 inches wide, and traverse at a speed of about 500 feet per miuute. They are capable of transmitting grain from end to end of the warehouses at the rate of 50 tuns per hour. There are chutes for passing grain from one floor to another, into the holds of vessels, or into wagons beneath. Beside the cranes there are eleven hoists for barrels and sacks, and twenty jiggers for lowering purposes.

The Birkenhead warehouses are in many respects similar to those on the Liverpool side of the water, and are fitted up in the same manner. Their storage capacity is 212,800 quarters of grain. They are not fire-proof. When completed, the warehouses on both sides of the Mersey will be handed over by the dock board under a ten years' lease to the Liverpool Grain Warehousing Company. We may here add that the imports of grain during the year 1867 into Liverpool were as follows: Wheat, 1,805,044 quarters; barley, 93,918 quarters; malt, 7,418 quarters; oats, 201,018 quarters; beans, 209,495 quarters; peas, 132,549 quarters; Indian corn, 913,855 quarters; oatmeal, 153,445 loads; flour, 382,572 sacks and 132,040 barrels—making a total of 3,363,293 quarters, 153,445 loads, 382,572 sacks, and 132,040 barrels; or about one-fourth of the entire grain imports of Great Britain.

A Royal Railway Train.

The Queen of England, with a numerous suite, recently left Windsor to pay her annual visit to Balmoral, in Scotland. It will interest our readers to know some of the particulars in regard to the style in which Her Majesty travels.

The directors of the Northwestern Railway Company were commanded to prepare a special train for the purpose, consisting of fourteen carriages. The Queen's carriage was fitted with a perfect system of electric communication with the guard—a thing which has bothered the English a good deal. This apparatus consisted of a small, square, gilt box, hollowed out in front, and furnished with a glass handle, by the pulling of which the Queen could at any moment bring the train to a dead stop. When once the handle was drawn out, it could not be replaced by persons occupying the car. An experimental trial proved that the plan operated very perfectly. This same system has been applied to a Birmingham train, and in two instances it has been called into use—once for a joke, by a young officer, and in the other case by a medical man, whose curiosity led him, when the express was approaching a station, to pull out the handle. To his great consternation and chagrin, the train was immediately pulled up, and he heard the bell in the guard's van ringing loudly. As the handle of the "communicator" remained out, the culprit was at once detected, and nearly lynched by the excited passengers, who were, of course, much surprised at the sudden stopping of the train, and annoyed at the loss of time occasioned by the foolish freak.

Her Majesty's saloon, in addition to the eelctric communication with the guard, was likewise fitted with an electric dial and index, for the purpose of calling the royal dressers and personal attendants, for whose accommodation a new saloon, expressly built by the directors, and was placed in a position in front of and directly adjoining the Queen's saloon. A time table was expressly arranged for running the train 591 miles, which was made in about nineteen hours.

The Pneumatic Dispatch.

We learn that the Governor has approved of the act to facilitate the transmission of letters and merchandise by means of the Pneumatic Dispatch, and that our citizens now have the promise of soon enjoying the most improved and rapid means of intercommunication. The act authorizes the laying down of the pneumatic tubes under the streets of New York and Brooklyn, and also under the waters of the North and East rivers.

The present enterprise contemplates the connection of the Brooklyn, Jersey City, and all our sub-post offices, with the general post office, and also the erection of pneumatic letter-boxes in place of the present lamp-post boxes, so that letters and parcels will be both collected and delivered by air pressure acting on cars, which will fly along at the rate of thirty miles an hour. The mails will go back and forth between the New York and Brooklyn and Jersey City post offices in from three to five minutes. Letters deposited in any of the street letter-boxes on the pneumatic line below Forty-second street will be carried to the general post office, or to any intermediate station, in from three to six minutes. Our citizens can easily understand the great benefit that will accrue to business transactions from this arrangement.

The introduction of the Pneumatic Dispatch is due to the efforts of our enterprising neighbor, Mr. Alfred E. Beach, of the SCIENTIFIC AMERICAN, and we congratulate him upon his success before the Legislature. The Pneumatic Dispatch was first put into practical operation last October, at the American Institute Fair, and a full account of its construction and operations was then given in our columns. We understand that it is the intention of the grantees to put a short line of the Pneumatic Dispatch into operation within the next ninety days. The exact route has not yet been determined, but it will probably extend from the post office, corner of Nassau and Liberty streets, to the City Hall Park. If this short line is found to operate as well as is expected, the pneumatic tubes will then be laid down extensively in many different directions.—*New York Sun.*

THE SALE OF PATENTS IN OHIO.

The General Assembly of Ohio, at its last session, enacted a law regulating the sale of patent rights in that State. The law renders it necessary for the patentee, or his authorized agent, to produce his documents to be examined by the Judge of Probate of the county, who issues a certificate authorizing the sale of rights, providing he is satisfied of the good faith of the parties. It is questionable whether any State has the constitutional right to impose restrictions upon the sale of patents granted by the United States government, but as the law was enacted for the purpose of preventing swindling, it cannot affect unfavorably legitimate and honorable enterprises.

Commissioner of Patents.

A recent telegram states that a movement is going on at Washington to secure the appointment of Hon. Elisha Foot—now of the Appeal Board—to the office of Commissioner of Patents. Judge Foot has a thorough knowledge of the patent law, and is well versed in mechanical science. The selection would be an excellent one.

Editorial Summary.

BREECH-LOADERS IN ITALY.—The Commission appointed by the Italian Government for examining into the comparative merits of the different breech-loading rifles known, have decided in favor of the Prussian needle gun. This is the only instance of its having been approved by a non-German state, all other countries having endeavored to construct an even more perfect weapon. More general recognition has been bestowed upon the Prussian breech-loading cannon. Having some time ago been adopted by Russia, Belgium, and for fortress and naval artillery, by Austria also, it is now about to be introduced into the Italian service.

THE SPECTRUM RECONSTRUCTED.—Prof. Listing, of Gottingen, considers the solar spectrum as made up of nine colors, in the following order: brown, red, orange, yellow, green, blue, indigo, violet, and lavender. He has also calculated the number of vibrations of each, and has found that their numbers constitute an arithmetical progression; the interval between one color and the next always being 48,524 billions of vibrations per second. The number of vibrations constituting the two extreme colors are represented by 364 trillions for the brown, and 801 trillions for the lavender.

THE London local post office is one of the best conducted institutions in the world. It employs 1,152 letter carriers, who distributed 76,000,000 letters in 1863, and in 1868 it is estimated will deliver 90,000,000; that is, 1,730,000 letters per week, and 288,000 per day. Carriers are paid abont twenty-five shillings per week—nearly $8 75—and the expense of the department is estimated at £120,000. The net profit amounts to nearly £300,000, or two millions of our money.

AT a meeting of the Société de Photographie, Paris, M. Civiale made some observations upon the employment of sulpho-cyanides in toning and fixing. He stated that in the summer of 1867 he fixed about 700 positive proofs by means of potassium and ammonium sulphocyanides. A print, one half of which had been protected from the light, the other unprotected, and which had been exposed for three months, showed only a uniform tint.

REMEDY FOR CHAFING.—Obese persons suffer greatly, especially in warm weather, from chafing. We know of nothing better than a wash of alum dissolved in water, and applied with a linen or cotton rag.

SOUNDINGS have been made in the sea to a depth of six thousand feet, without finding bottom, within 1½ miles of the shore of the island of Santa Cruz, W. I. This island is the apex of an immense submarine mountain.

THE grasshoppers, having survived rain, fire, snow, and frost, during last fall and winter, have hatched out thicker than ever on the prairies of Iowa and many other western States.

NEVER leave file marks on a turning tool. It greatly weakens the material. The grindstone, in this case, is a better finisher than the file.

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Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the most prominent home and foreign patents.

CLAMP ATTACHMENT TO SAW HORSES, ETC.—Frederic W. Marsfield, Fitchburgh, Mass.—This invention relates to a method of constructing portable clamps for holding wood firmly upon a saw horse or bench, whereby wood may be sawed or cut with less fatigue to the operator.

EXPANDING PULLEY.—Thomas H. Savery, Wilmington, Del.—The object of this invention is to provide an expanding pulley the operation of which is more perfect for the use intended than others heretofore in use.

REEL FOR HARVESTERS.—G. W. N. Yost, Corry, Pa.—The object of this invention is to produce a reel which can be adjusted for straw of different hight which will not thrash the grain out while throwing it back and which can be easily folded together for transportation.

MOWING MACHINE.—G. W. N. Yost, Corry, Pa.—This invention consists in the manner of arranging the frame of the machine. The same is composed of a horseshoe-shaped metal bar or plate to the two ends of which the shoe at the inner end of the finger bar is secured. The main body of the frame is about on a level with the driving shaft of the machine while its two ends are bent down to reach to the shoe and to be hinged to the finger bar.

NARROW SWATH HARVESTER.—G. W. N. Yost, Corry, Pa.—The object of this invention is to produce a harvester which can be drawn by one horse and which can mow as much grain as can be bound by one man riding on the platform of the machine. One man for binding, one boy for driving, and one horse will be all that is required to operate the machine.

CARPET WEAVING MACHINE.—Moritz Wolf, Philadelphia, Pa.—This invention relates to an arrangement of the Jacquard attachment of a carpet loom, and consists in the use of a double set of needles by which the harness is operated. Two figure cylinders are employed, one for each set of needles. One cylinder is provided with figure cards in the usual manner and raises as many of the vertical needles which constitute one set as have to be lifted according to the pattern. The vertical needles which are raised elevate the ends of the horizontal needles which constitute the other set and those horizontal needles which are thus elevated will at the next stroke of the upper cylinder, which has only holes but no cards, be thrown back as they will not fit into the holes of the cylinder and thereby the threads of the harness with which such needles are connected will be thrown into the lifter or knife so as to be elevated by the same during its next move.

APPARATUS FOR DISTILLING WOOD, ETC.—Gaspar Hunziker, Summit, Miss. This invention relates to a method of constructing an apparatus for distilling wood and stone coal, whereby the resin and tar contained in the same are more effectually separated from the charcoal or carbon, and whereby the same is more economically done.

AUGERS AND BITS.—James Swan, Seymour, Conn.—This invention relates to a machine for manufacturing screw augurs and bits, and it consists in a novel arrangement of dies and and a clamp, whereby bits and augers may be very expeditiously manufactured, and at a moderate cost.

FLUE BLOCK.—John Binns, Oskaloosa, Iowa.—This invention relates to a flue block for stovepipes to pass through in a partition or flooring, in order to prevent heated pipes from firing the building.

ENAMELING MOLDINGS.—John Johnson, Boston, Mass.—This invention relates to a machine for enameling moldings, preparatory to gilding the same, and it consists in a new and improved heating arrangement for warming the preparation, smoothing brushes, and a scraper, all arranged in such a manner that the desired work may be performed expeditiously and in a perfect manner.

EXPANSION ENGINE.—A. Seely, Alton, Mo.—This invention consists in an improved method of expanding steam in two cylinders, the pistons of which are connected with cranks at right angles on the same shaft, whereby the expansion of steam in two connected cylinders can be made available and practicable on boats or elsewhere.

VOTE REGISEER.—N. A. Patterson, Winchester, Tenn.—This invention relates to the registering of votes of the members of an
and consists of a column of blocks bearing the raised names of such members, and so connected by wires that they can be actuated to indicate the negative or affirmative votes of each member. The invention contemplates the subsequent printing of the whole vote, and its mechanism is arranged with reference to that end.

SLEIGH.—Chester Heald, Marshalltown, Iowa.—This invention relates to the construction of sleighs, and certain braking mechanism attached thereto.

SHINGLE MACHINE.—Luther H. Dodge, Oshkosh, Wis.—This invention relates to shingle machines, and is more particularly designed as an improvement upon that known as the "Valentine Shingle Machine," though it may be applicable to other machines, having a similar operation of the carriage. It consists in actuating the carriage holding the shingle block back from the saw, by the positive movement of a revolving arm, thus dispensing with the spring now used for that purpose, and obviating the disadvantages attending the use of such springs.

HOE.—Josiah Dodge, Grass Valley, Cal.—This invention consists in making the hoe with a horn or pick attached to the blade, and with a forked shank, thereby adapting it to various new and useful purposes, and rendering it much more strong and durable than the ordinary hoe.

MILL STONE DRESS.—H. L. Spencer, Social Circle, Ga.—This invention relates to an improved method of dressing mill stones for grinding wheat, corn, or other grain.

SELF-LIGHTING APPARATUS.—Gustav Müller, Newark, N. J.—This invention relates to certain improvements on the well known Döbereiner's inflammable lamp, and consists in arranging the tube through which the hydrogen passes in a vertical position, and in suspending the spongy platinum above the same, and in protecting the platinum in a perforated bell.

PANTALOON MEASURING RULE.—Patrick W. Dolan, Jersey City, N. J.—This invention has for its object to furnish a simple and easy way for obtaining the correct measurement for gentlemen's pantaloons, so that no mistake can be easily made in the length and other measurements, and the invention consists in an extended rule, with a measuring tape attached thereto.

CANAL BOAT PROPELLER.—D. H. Heyen, New York city.—This invention has for its object the construction and arrangement of a propeller wheel which shall be adapted to the propulsion of boats on canals, more especially, but which may be used to propel boats on all navigable waters.

COMBINED MOWER AND REAPER.—G. W. N. Yost, Corry, Pa.—This invention relates to a mower and reaper, so arranged that the finger bar and its appendages can be easily raised over obstructions, while mowing, and can be held in an elevated position for reaping, the finger bar being held steady and prevented from lateral motion by a guide, in which the finger bar plays up and down.

DISTILLING APPARATUS.—Adolph Meyendorff, New York city.—This invention relates to a distilling apparatus, so arranged that it will distill directly from the mash, and so that none of the alcoholic contents of the mash are lost, and the spirits separated, according to their degree of purity, and that the condensed liquid in the rectificator will be decomposed so as to give off any alcoholic parts that may remain in it. The invention consists chiefly in the use, in one apparatus, of two stills, which are connected by means of pipes in such manner that the vapors arising from one will be forced through the mash in the other, so as to take up all the alcohol that would otherwise remain in the second still.

CAR AXLE CAP.—William Werts, Pana, Ill.—This invention has for its object to furnish an improved cap for car axles, which shall be simple in construction, effective in operation, and easily opened and closed.

CROZES.—John C. Hofer, Bell Air, Ohio.—This invention has for its object to improve the construction of crozes, designed especially for slack work, such as flour, apples, sugar, cracker, and salt barrels, nail kegs, and other cooperage of similar character.

WIND MILL.—G. J. Thorn, Pecatonica, Ill.—This invention relates to a method of constructing wind mills, whereby the fans of the same are always in proper position with respect to the direction of the wind, and the speed of the same is more uniform and regular.

RETORTS.—J. D. Perrin & Joseph Saunders, Brooklyn, N. Y.—This invention relates to a new manner of arranging retorts for concentrating sulphuric acid and other purposes, so that circulation of the liquid to be concentrated or evaporated may be produced in a series of retorts at once, the liquid flowing from one retort to the other.

SASH FASTENER.—Ralph Thomas, Waterbury, Conn.—This invention relates to a sash fastener, which consists of a spring bolt, fitted in a case, secured to the upper edge of the lower sash, and of a cap hinged to the lower bar of the upper sash; the cap can be locked by means of the bolt to the case, and thereby the two sashes are locked together securely, so that they cannot be opened unless the cap is first released from the bolt.

CLEVIS IRON.—Thomas P. Warren, Norfolk, Va.—This invention is a simple, cheap and durable clevis, that can be attached to a plow beam of any size, by which the plow can be adjusted more or less "to land," and can be caused to cut a deep or shallow furrow, as may be desired.

BRUSH.—John F. W. Dorman, Baltimore, Md.—In this invention the bristles are put up in sparate packages, one of which answers for a brush; and a new but cheap device is employed to attach them to the handle. The packages are designed to be made and sold independently of the handle, to which they can in a moment be attached, or from which they can be detached—so that at any time when the bristles wear out or become damaged they can be removed and new ones substituted.

CHURN DASHER.—J. D. Kellogg, Jr. Northampton, Mass.—This invention relates to a new form of churn dasher, by which the butter can be more quickly and easily made and gathered than by any hitherto in use, it being only necessary to rotate the dasher in one direction to make the butter, and in the reverse direction to gather it.

CUTTER HEAD AND SPINDLE FOR MACHINES FOR PLANING, RABBETING, MOLDING, ETC.—Frank Douglas, Norwich, Conn.—This invention comprises three important features: First, a new method of adjusting the cutters in the head, by which they can be held more firmly, and by which cap cutters, consisting of two single cutters, can be employed; second, in a new form of cutter spindle and a new method of attaching it to the shaft, by which it can be instantly adjusted with perfect accuracy, and so held for any length of time; and thirdly, in a new method of stopping the spindle shaft, by which it can be easily adjusted and oiled, and by which its friction is greatly diminished.

TRACTION RAILWAY BRAKE.—Rudolph d'Heurense, San Francisco, Cal.—This invention consists in the application of double flanged or grooved driving-wheel to locomotive engine.

BED CLOTHS HOLDER.—J. B. Munson, Baily Hollow, Pa.—This invention has for its object to furnish an improved device for securing the bed cloths in place upon the bed, so as to prevent them from being thrown out of place by the restlessness of the sleeper.

SPRING BED BOTTOM.—E. Gibbs, and O. W. Gibbs, Richland Center, Wis.—This invention has for its object to furnish an improved spring bed bottom, simple and durable in coustruction, which will not allow the head part to tip down, and which will be noiseless, easy, and comfortable in use, whether lain upon by a light or heavy person.

VISE.—F. B. Johnson, De Witt, Iowa.—This invention has its object to furnish a simple and convenient bench vise which shall be so constructed as to adapt itself to the shape of the object to be held whether said object be straight or tapering.

SHINGLE MACHINE.—Lyman Jennings, Winchenden, Mass.—This invention consists in the horizontal action of the cutter and elevating block rest, together with the mechanism conducing to the operation of the same.

CAR BRAKE.—Wm. T. Parsons, Thomasville, Ga.—This invention relates to an improved rail-car brake, which consists of shoes pendant with suitable mechanism, whereby they are let down under the wheel and partially receiving the weight of the latter, act as a chock to stop its revolution.

TIRE SHRINKING AND PUNCHING MACHINE.—Walter Britton, Abingdon, Ill.—The object of this invention is to accomplish the shrinking of wheel tires in a simple and effective manner.

APPLE PARING AND CORING MACHINE.—Andrew Clark, La Fayette, Ind.—The object of this invention is to produce a machine by means of which apples and other similar fruit may be pared, cored, and quartered in an expeditious and rapid manner.

MACHINE FOR DOUBLE LAPPING SHEET METAL.—Geo. H. Goldsmith, Waverly, Ill.—This invention relates to a machine chiefly used by tinsmiths. It consists of an automatic break bar for bending the tin with a double lap at the edge, together with other devices perfecting the operation of the whole.

SAW GUIDES.—T. Milner, Houston, Texas.—The nature of this improvement consists in the arrangement of the parts constituting the parts of a guide for circulrr saws, so that they can be operated with facility and accuracy, together with devices for improving and perfecting the whole.

BREAST PUMP.—Wm. T. Fry, New York city.—This invention relates fo an imgrovement in breast pumps of that class which are provided with an elastic bulb for producing the necessary suction.

PAD BILLET.—Lydia Hays, Ames, Iowa.—This invention relates to a pad billet for harnesses, and it consists in a novel construction of parts, whereby several advantages are attained over the ordinary leather billet.

ROPE TRACES.—Thomas Newman, New Orleans, La.—This invention relates to an improvement in rope traces for harnesses and it consists in a novel manner of securing the clips to the trace, whereby firm connections of the trace with the collar hames and whiffletrees are obtained, and the trace adapted for all kinds of harnesses.

PAPER BOX.—William Armour, Belfast, Ireland.—This invention relates to an improvement in the construction of fancy paper boxes, designed more especially for holding gloves, handkerchiefs, confectionery, etc. The object of the invention is to obtain by a simple arrangement two compartments which, when the box is opened, are both accessible, each being provided with a separate or independent lid. The invention has also for its object a fastening by which the box may be kept in a closed state and still be readily opened when closed, the device as a whole being designed as a new and improved article of manufacture for the purpose specified, both useful and chaste or ornamental.

COMBINATION OF SQUARE AND BEVEL.—H. G. Taylor, Port Hope, C. W.—This invention consists in a combination of a square and bevel, whereby the blade may be set at any required angle or bevel, and at the same time a square be always preserved.

SHARPENING CUTLERY.—Augustus Thayer, Albany, N. Y.—This invention relates to a device for sharpening cutlery, and is more especially designed for sharpening table cutlery, scissors, pocket knives, etc., but it may be used for sharpening cutlery of various kinds.

JOURNAL BOX.—James Robinett, Petersburg, Va.—This invention relates to an improvement in that class of bearing pieces employed in car axle boxes, in which the bearing of the body piece is of iron, the main portion of the convex surface being of Babbit metal, and the central portion being of brass. The improvement consists in a new method of attaching the brass central plate to the iron body of the bearing piece, whereby the former will be more securely held in position, and prevented from working out, or being thrown out by any accident.

IMPROVED TOOL FOR REJEWELING WATCHES.—C. Hopkins, Philadelphia, Pa.—This tool is designed to facilitate the work of the watch repairer, in lifting the flange of the socket or bezel in which the previous jewel, now broken out, was set, so that the new jewel can be readily dropped into place It may also be employed for reaming out the socket or bezel where it is too small for the new jewel, or has been damaged by the breaking out of the old one.

EXTENSION NOTICES.

Elias Ingraham of Bristol, Conn., having petitioned for the extension of a patent granted to him the 3d day of September, 1861, for an improvement in design for clock case front, for seven years from the expiration of said patent, which takes place on the 3d day of September, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 17th day of August next.

Gardner Chilson, of Boston, Mass., having petitioned for the extension of a patent granted to him the 26th day of September, 1855, and reissued the 27th day of September 1864, for an improvement in furnace or heat regulator and radiator, for seven years from the expiration of said patent, which takes place on the 26th day of September, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 31st day of August next.

Wm. H. Atkins and Joseph C. Burritt, of Ithaca, N. Y., having petitioned for the extension of a patent granted to him the 19th day of September, 1854, for an improvement in calendar clocks, for seven years from the expiration of said patent, which takes place on the 19th day of September, 1868 it is ordered that the said petition be heard at the Patent Office on Monday the 31st day of August next.

Business and Personal.

The charge for insertion under this head is one dollar a line.

Patent Office Reports.—Persons desiring Patent Office Reports can be accommodated at low prices. Address Samuel C. Jones, Box 773 New York.

Bartlett machine and needle depot, 569 Broadway, New York. Needles for all machines, hackle, gill pins, etc.

Wanted—to correspond with makers of starch manufacturing machinery. Address B. Hubbe, engineer, 25 Chambers st., New York.

A. B. Broughton's oilers are the best in every respect.

Balloon for sale—25,000 feet capacity—netting and ropes alone worth $150, all for $400. Address O. T., care box 517, Dayton, Ohio.

Sail-safe—sure prevention against sailboat-capsizings. Patent for sale. Also, samples at $8. Dr. Oehme, Plymouth, Mass.

Situation wanted as assistant railroad engineer by H. A. Collins, Packer Institute, Brooklyn.

Parties desiring patentable improvements in any machine, manufacture, or process, can engage the assistance of a rare inventive genius by addressing G. L. Wild, Washington, D. C.

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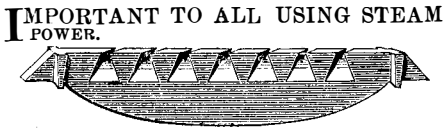

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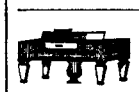

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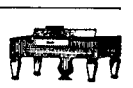

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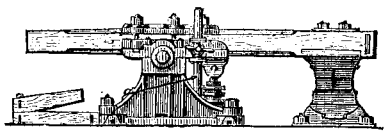

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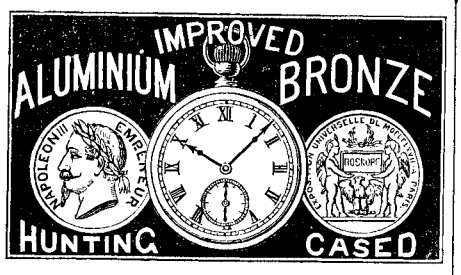

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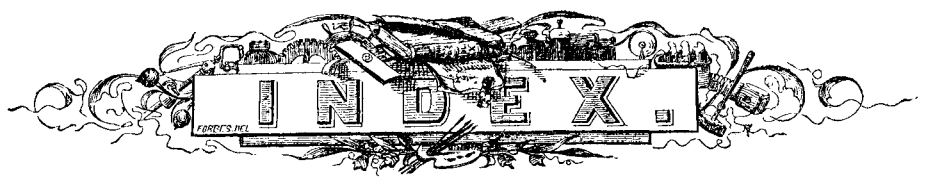

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